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JC588 U.S. PTO

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

STREET NUMBER	ANTICIPATED CLASSIFICATION OF THIS APPLICATION:		PRIOR APPLICATION	
	CLASS	SUBCLASS	EXAMINER	ART UNIT
12344.2USC1			F. POINVIL	2761

CERTIFICATE UNDER 37 CFR 1.10:

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By: Linda McCormick  
Name Linda McCormick

JC542 U.S. PTO  
09/437567

11/10/99

CONTINUATION APPLICATION UNDER 37 C.F.R. § 1.53(b)

BOX PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, DC 20231

Dear Sir:

This is a request for filing a continuation application under 37 CFR § 1.53(b) of Serial No. 08/539,413, filed on October 5, 1995 entitled METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES by the following inventor(s):

Full Name Of Inventor	Family Name SEARE	First Given Name JERRY	Second Given Name G.
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Full Name Of Inventor	Family Name SENNETT	First Given Name VICKI	Second Given Name SUE
Residence & Citizenship	City SANDY	State or Foreign Country UTAH	Country of Citizenship USA
Post Office Address	Post Office Address 1731 EAST ALBIN DRIVE	City SANDY	State & Zip Code/Country UTAH 84092/USA

1. ☒ Enclosed is a copy of the prior application; including the specification, claims, drawings, oath or declaration showing the applicant's signature, and any amendments referred to in the oath or declaration filed to complete the prior application. (It is noted that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein.) The continuing application is as follows: 81 pages of specification, 37 claims, 1 pages of abstract, 36 pages of Microfiche Appendix, 12 sheets of drawings, and 22 pages of oath or declaration.
- ☒ The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
2. ☒ Cancel original claims 1-37 of this application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

3. ☒ The filing fee is calculated below:

**CLAIMS AS FILED**

NUMBER FILED	NUMBER EXTRA		RATE	FEE
<b>TOTAL CLAIMS:</b> 18 -20	0	x	\$18.00	\$0.00
<b>INDEPENDENT CLAIMS</b> 2 -3	0	x	\$78.00	\$0.00
			<b>BASIC FILING FEE:</b>	<b>\$760.00</b>
			<b>TOTAL FILING FEE:</b>	<b>\$760.00</b>

☐ A Verified Statement that this filing is by a small entity is already filed in the prior application.

☐ A Verified Statement that this filing is by a small entity is attached.

☒ Payment of fees:

☒ Attached is a check in the amount of \$760.00 .

☐ Please charge Deposit Account No. 13-2725.

☒ The Commissioner is hereby authorized to charge any additional fees as set forth in 37 CFR §§ 1.16 to 1.18 which may be required by this paper or credit any overpayment to Account No. 13-2725.

☒ Amend the specification by inserting before the first line the sentence:

"This application is a Continuation of application Serial No. 08/539,413, filed October 5, 1995, which is a Divisional of application Serial No. 08/264,795, filed June 23, 1994, which issued as U.S. Patent No. 5,557,514 on September 17, 1996 application(s) are incorporated herein by reference."

☐ A set of formal drawings (\_\_\_\_ sheets) is enclosed.

8. ☐ Priority of application Serial No. \_\_\_\_\_, filed on \_\_\_\_\_ in \_\_\_\_\_, is claimed under 35 U.S.C. 119.

☐ The certified copy has been filed in prior application Serial No. \_\_\_\_\_, filed \_\_\_\_\_.

9. ☐ The prior application is assigned of record to \_\_\_\_\_ located at \_\_\_\_\_.

10. ☒ The Power of Attorney in the prior application is to:

Merchant & Gould P.C.  
3100 Norwest Center  
90 South Seventh Street  
Minneapolis, MN 55402-4131

11. ☒ A preliminary amendment is enclosed. (Claims added by this amendment have been properly numbered consecutively beginning with the number next following the highest numbered original claim in the prior application.)

- ☐ Fee for excess claims is attached.
12. ☐ A petition and fee has been filed to extend the term in the prior application until \_\_\_\_\_. A copy of the petition for extension of time in the prior application is attached.
13. ☐ The inventor(s) in this application are less than those named in the prior application and it is requested that the following inventors identified above for the prior application be deleted:
14. ☒ Also Enclosed: Statement in Accordance with 37 C.F.R. 1.608(a), Statement of no New Matter Submitted in Substitute Specification, substitute specification, Proposed Change to the Drawings, and Revised Fig. 12
15. ☒ Address all future communications to the **Attention of Alan G. Gorman** (may only be completed by attorney or agent of record) at the address below.
16. ☒ A return postcard is enclosed.

Respectfully submitted,

MERCHANT & GOULD P.C.  
3100 Norwest Center  
90 South Seventh Street  
Minneapolis, Minnesota 55402  
(612) 332-5300

Date:

November 10, 1999



Alan G. Gorman  
Reg. No. 38,472  
AGG:PSTkaw

S/N NEW FILING

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SEARE ET AL.	Examiner:	UNKNOWN
Serial No.:	NEW FILING	Group Art Unit:	UNKNOWN
Filed:	HEREWITH	Docket No.:	12344.2USC1
Title:	METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES		


CERTIFICATE UNDER 37 CFR 1.10:

"Express Mail" mailing label number: EL455018055US

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I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Assistant Commissioner for Patents, Washington, D.C. 20231.

By:



Name: Linda McCormick

**PRELIMINARY AMENDMENT**

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Prior to examination please amend the above-identified patent application as follows.

**In the Drawings**

Please replace Figure 12 with revised Figure 12.

**In the Specification**

Please amend the specification as follows:

Page 9

Line 24, change "providers" that follows "The statistical" to ---providers'---.

Line 25, delete "historical".

Page 10

Lines 20-21, delete "stored in the parameter tables".

Line 22, delete "in the parameter tables".

Line 23, change "profile" to ---profiles---.

### Page 12

Line 23, change "profile" to —profiles—.

Line 24, change "is" to —are—.

Line 24, change "norm" to —norms—.

### Page 13

Line 5, change "Twenty" to —Multiple—.

Line 11, delete "Family Table,".

Line 14, after "Category Parameter Table," insert —and—.

Lines 14–15, delete "and Family Table".

Line 24, change "describe" to —described—.

### Page 16

Line 2, change "HCPCs" to —HCPCS—.

Lines 19–22, delete in their entirety.

### Page 18

Lines 12–16, delete in their entirety.

### Page 19

Line 2, change "groups" to —identifies—.

Lines 2–3, change "into inclusive or exclusive diagnosis codes. This grouping is unique to each index code" to —relevant to each specific index code—.

Line 5, delete "classified into categories and".

Line 9, delete "summary".

Line 10, change "ICD-9" to —Index Code—.

Line 12, column 1, change "ICD-9" to —Beg-ICD—.

Line 13, column 1, change "ICD-9" to —End-ICD—.

### Page 20

Line 4, change "(EOC). Which is keyed off the Index Code" to —(EOC) and is keyed off the Index Code field—.

Lines 6–8, delete "Any one of these ICD codes may or may not appear during the search for the Index code and still have the EOC be valid."

Lines 12–19, delete in their entirety.

Line 22, after "codes" insert —beginning—.

Page 21

Line 1, change "file layout" to ---table---.

Page 22

Lines 10–11, delete in their entirety.

Page 23

Line 3, change "filter" to ---step---.

Line 7, change "ICD–9" to ---Index Code---.

Page 24

Lines 3–4, delete in their entirety.

Lines 15–16, delete in their entirety.

Page 25

Line 3, after "inclusion" insert ---in an EOC---.

Line 4, after "exclusion" insert ---of a patient history,---.

Line 18, after "patient" insert ---history---.

Page 26

Lines 8–10, delete in their entirety.

Page 27

Line 2, change "number of days" to ---time period---.

Line 8, in the table, above "Staging Indicator" insert ---Index Code---, above "Character" insert ---Alpha/Numeric---, above "2" insert ---5---, above "P = Preventive" insert ---Left justified assumed decimal after 3rd position---.

Line 9, change "Number of days" to ---Time period---.

Line 10, change "Number of days" to ---Time period---.

Line 15, after "staging" insert ---indicator---.

Lines 18–19, delete in their entirety.

Page 28

Lines 4–6, delete "The end user may populate an identical table with their own unique profiles created by analyzing their claims history data."

Line 7, change "ICD–9" to ---Index---.

Page 29

Line 7, change "CPT's" to ---CPTs"

Line 7, delete "statistically and".

Line 8, after "billed and" insert ---statistically---.

Lines 8–9, change "based on an index ICD code" to ---for a specific Index Code---.

Lines 10–14, delete in their entirety.

#### Page 30

Line 2, before "categories" insert ---procedural---.

Lines 4–6, delete "The end user may populate an identical table with their own unique profiles created by analyzing their claims history data."

Line 7, change "ICD–9" to ---Index---.

#### Page 31

Line 6, change "which Categories are statistically and" to ---which procedural categories are---.

Line 7, after "billed and" insert ---statistically---.

Lines 7–8, change "based on an index ICD code" to ---for a specific Index Code---.

Lines 9–12, delete in their entirety.

#### Page 32

Lines 2–3, change "length of time associated with an episode of care" to ---EOC duration distribution---.

Lines 3–5, delete "NOTE: The end user may populate an identical table with their own unique profiles created by analyzing their claims history data."

Line 6, change "ICD–9" to ---Index Code---.

#### Page 33

Line 1, change "stores the projected length of an episode" to ---gives access to statistical information about EOC durations---.

Lines 6–7, delete in their entirety.

Line 13, first column, change "CPT" to ---Beg–CPT---.

Line 14, first column, change "CPT" to ---End–CPT---.

Lines 22–23, delete in their entirety.

#### Page 34

Lines 1–17, delete in their entirety.

Lines 22–24, delete "– A<sub>1</sub>, A<sub>2</sub>, P<sub>1</sub>, E<sub>1</sub>, E<sub>2</sub>, L<sub>1</sub>, L<sub>2</sub>, R<sub>D1</sub>, R<sub>D2</sub>, M<sub>D1</sub>, M<sub>D2</sub>, S<sub>D1</sub>, S<sub>D2</sub>. (All of these categories are included as part of the other seven profile classes."



Page 35

Line 1, delete "-- All Categories".

Line 2, delete "-- M<sub>T1</sub>, M<sub>T2</sub>, R<sub>T1</sub>, R<sub>T2</sub>, O<sub>1</sub>, O<sub>2</sub>".

Line 3, delete "-- S<sub>T1</sub>, S<sub>T2</sub>, R<sub>T1</sub>, R<sub>T2</sub>, O<sub>1</sub>, O<sub>2</sub>".

Line 4, delete "-- S<sub>T1</sub>, S<sub>T2</sub>, M<sub>T1</sub>, M<sub>T2</sub>".

Line 5, delete "-- R<sub>T1</sub>, R<sub>T2</sub>, O<sub>1</sub>, O<sub>2</sub>".

Line 6, delete "-- M<sub>T1</sub>, M<sub>T2</sub>".

Line 7, delete "-- S<sub>T1</sub>, S<sub>T2</sub>".

Lines 13–14, delete in their entirety.

Page 36

Line 2, change "filter" to ---step---.

Line 14, change "Use:" to ---USE:---.

Lines 15–16, change "Preliminary select for where in EOC process qualifying circumstances should apply" to ---Preliminary step in the EOC qualifying process---.

Page 37

Lines 2–25, delete in their entirety.

Page 38

Lines 1–24, delete in their entirety.

Page 39

Line 3, before "Table" insert ---This---.

Page 40

Lines 3–5, change "To act as a preliminary qualifying mechanism for determining if claims information can be used in the assignment of a parameter" to ---This table groups all rules qualifying EOCs---.

Line 18, change "number required" to ---Number Required---.

Line 19, after "occurrences" insert ---required---.

Lines 20–25, delete in their entirety.

Page 41

Lines 1–25, delete in their entirety.

Page 42

Lines 1–23, delete in their entirety.

Page 43

Lines 1–7, delete in their entirety.

Line 9, delete "common".

Line 10, change "given" to —specific—.

Page 44

Line 9, change "a parameter" to —an EOC—.

Lines 16–17, delete in their entirety.

Page 45

Lines 1–20, delete in their entirety.

Page 46

Line 2, delete "common".

Line 3, change "given" to —specific—.

Line 15, change "a parameter" to —an EOC—.

Lines 20–21, delete in their entirety.

Page 47

Lines 1–16, delete in their entirety.

Page 48

Lines 4–5, delete "This is standard HCFA information."

Line 7, first column, change "CPT" to —Beg-CPT—.

Line 8, first column, change "CPT" to —End-CPT—.

Lines 17–20, delete in their entirety.

Page 49

Line 6, first column, change "Zip Code" to —Beg-Zip Code—.

Line 7, first column, change "Zip Code" to —End-Zip Code—.

Lines 14–15, delete in their entirety.

Lines 18–19, delete "This is standard HCFA information."

Line 20, change "ICD-9" to —Index—.

Page 50

Line 2, column 1, before "CPT" insert —Beg—.

Line 3, column 1, before "CPT" insert —End—.

Lines 17–18, change "If multiple multipliers are used, compute the average of them and use that." to —Multiple multipliers may be applicable to each parameter.—

Lines 19–22, delete in their entirety.

Page 51

Line 6, column 1, change "ICD–9" to —Index—.

Page 52

Lines 1–2, change "It multipliers are used, compute the average of them and use that." to —Multiple multipliers may be applicable to each parameter.—

Lines 3–6, delete in their entirety.

Line 10, change "CPT code" to —CPT codes—.

Line 13, column 1, change "ICD–9" to —Index—.

Page 53

Lines 5–6, change "If multiple multipliers are used, compute the average of them and use that." to —Multiple multipliers may be applicable to each parameter—.

Lines 8–23, delete in their entirety.

Page 54

Lines 1–3, delete in their entirety

Page 56

Between lines 19 and 20, insert —DATA PROCESSING METHODOLOGY—.

Page 57

Line 8, change "profiles" to —profile—.

Lines 9–10, change "print out" to —printout—.

Line 13, change "This includes" to —Some examples include—.

Page 58

Line 14, after "billings" insert —are—.

Line 16, change "years" to —years—.

Lines 16–17, delete "and about fifty million claims".

Line 27, change "ID'S" to —IDs—.

Line 27, change "is" to —are—.

Page 59

Lines 3–4, delete "The preferred embodiment of this invention."

Line 6, change "CARE TRENDS" to —CareTrends—.

Line 10, change "is" to —are—.

Line 10, change "cross walked" to —crosswalked—.

Lines 11–12, change "with result" to —with the results—.

Line 19, change "by CES" to —by Medicare's Claims Edit System (CES)—.

Line 21, change "checked" to —validated—.

Line 22, change "(ICD 9)," to —(ICD–9);—

Line 26, delete "of".

Line 26, after "for" insert —the—.

Line 27, change "804," to —804 and—.

#### Page 60

Lines 1–3, delete ", (i.e. not adding denials, adding rebundles and adding other lines that have not been specifically excluded)".

Lines 4–12, delete in their entirety.

#### Page 61

Lines 11–12, change "Type of Service or Benefits to Specialty type" to —type of service, specialty type—.

Line 15, change ", the Description table" to —Description tables—.

Lines 16–18, delete "HCPCS means Health Care Financing Administration Common Procedure Coding System provided by the U.S. Government;".

Line 26, delete "This function is also performed only on CPT codes 10000–99999."

#### Page 62

Between lines 16–17, insert the following paragraph:

—Figure 9 depicts episode of care formation in the preferred embodiment. This processing includes processing the records in the extended data set that relate to the current index code. This relation is determined by the index tables. Then the records are broken into potential episodes of care based on a period of time specified in a window table. Then the episode of care is qualified based on the rules in a qualifying table. Qualifying episodes of care are inserted into the episode of care table.—

Line 27, delete "window".

#### Page 63

Line 20, change "profile" to —EOC—.

#### Page 64

Line 7, change "irrelevant" to —relevant—.

Page 65

Line 2, change "profiles" to --EOCs--.

Line 7, change "four inter-relational" to --inter relational--.

Between lines 13 and 14, insert the following paragraph:

--First, 1205, a temporary file is created based on combining the authorized and/or disallowed ICD codes that are associated with a given index code in the Index Global Table (listing preventative and aftercare codes) and the Index Detail tables. The temporary file is created using the Index Table, which determines whether or not the Index Detail Table only should be accessed or whether the Index Global Table is also necessary for drafting the temporary file.--

Line 14, change "First, 1201" to --Second, 1202--.

Line 15, change "general" to --principal--.

Line 16, delete "with" and insert --within a patient history having an--

Line 17, following the code insert --. It is contemplated that the number of occurrences of a particular index code can be defined by the user. In the present embodiment, it is recommended that the particular index code being sought occur--

Line 17, delete "Second, 1202,"

Lines 18-27, delete in their entirety.

Page 66

Line 1, delete "considered in the criteria of an episode of care."

Line 1, change "Fourth, 1204," to --Third, 1202,--.

Lines 2-3, delete "once the data history has been searched for qualifying circumstances,"

Line 4, change "three inter-relational Index Tables" to --inter relational qualifying tables--.

Line 5, delete "qualifying".

Line 8, change "with" to --or--.

Lines 9-11, delete in their entirety.

Between lines 11 and 12, insert the following paragraph:

--Fourth, the patient records are compared against the inter relational qualifying tables to ensure compliance with all patient-level qualifying rules. Patient records that fail to qualify are no longer considered for EOC evaluation for this Index Code, however, they may still qualify for other Index Code analysis. Fifth, all relevant line items for every remaining patient record are checked

against the temporary file created in step one for complicating diagnosis codes. Any patient record thus identified with a complicating diagnosis code is removed from further EOC processing.—

Lines 12–23, delete in their entirety.

Line 26, delete "a diagnosis to establish".

#### Page 67

Line 1, after "of the invention." insert the following paragraph:

—A clear window time period is selected for the specific Index Code from the window table 1206. Next, 1207 proceeding chronologically, each record is compared with the record immediately preceding it. The first record read defines the beginning event of an initial episode of care and the last record read defines the terminating event of a final episode of care. If the two records being compared are separated by a time period equal to, or greater than, the clear window the earlier record is identified as the terminating event of the earlier episode and the later record is identified as the beginning event of the next episode. Accordingly, the initial episode of care and the final episode may be the same episode of care. It is also possible, for the first record and the last record to be the same record. This iterative process is continued for all remaining records for all patient claims. In this fashion potential EOCs are identified within the patient claims.—.

Line 1, delete "Based on the staging".

Lines 2–27, delete in their entirety.

#### Page 68

Lines 1–2, delete in their entirety.

Line 4, change "The patient record" to —Each potential episode—.

Line 5, change "at least two" to —the required number of—.

Line 5, after "service" insert —within the EOC 1208—.

Line 6 change "appears on only one date" to —does not appear the required number of times—.

Line 6, change "record is rejected" to —potential EOC is pended—.

Line 7, change "record" to —potential EOC—.

Line 9, change "an" to —a potential—.

Line 11, delete "the patient record will be rejected and".

Lines 12–14, change "would then resume with a new patient record and data sort by index code" to —continues for all patient records—.

Lines 15–16, change "the information can be sorted by" to —a profile is assigned to the EOC based upon—.

Line 17, change "1210" to --1209--.

Page 69

Lines 4–5, change "If the patient record contains the minimum criteria for an EOC then" to --After all valid EOCs have been assigned to a unique profile--.

Lines 8–9, change "Patient records that have not been rejected by this point in the process" to --The data from qualified EOCs--.

Line 9, after "category" insert --parameter--.

Line 10, change "1211" to --1210--.

Lines 15–17, delete "The information generated is driven by the index code and is sorted chronologically and by category of procedures."

Line 21, change "1212" to --1211--.

Line 22, change "a on-line" to --an on line--.

Page 70

Lines 1–3, delete in their entirety.

**IN THE CLAIMS**

Please cancel claims 1–37.

Please add new claims 38–55 as follows:

38. A computer-implemented process for processing medical claims including the steps of:

- (a) reading a medical claim data, input as at least one of a plurality of data records, into a computer memory;
- (b) validating each of the at least one of a plurality of data records for at least one of a diagnosis code and a treatment code;
- (c) reading at least one pre-defined relationship between the at least one of a diagnosis code and a treatment code in the validated at least one of a plurality of data records and pre-defined episode treatment categories; and
- (d) grouping the validated at least one of a plurality of data records to an episode treatment category based upon the pre-defined relationship, each episode treatment category having a dynamic time window defining a time period during which validated at least one of plurality of data records may be grouped to an episode treatment category.

39. The process as claimed in claim 38 wherein the step (e) further includes the step of assigning treatment and cost information to the episode treatment category.

40. The process as claimed in claim 38 wherein the step (e) further includes the step of classifying the patient records into at least one of a plurality of episode treatment groups each of the plurality of episode treatment groups being defined by an episode treatment category.

41. The process as claimed in claim 40 wherein the episode treatment groups further comprise clinically homogeneous groupings with respect to the underlying cause of illness and treatment requirement.

42. The process as claimed in claim 40 wherein an active and open episode treatment group comprises an episode treatment group number, sequential episode number, and most recent anchor date of treatment.

43. The process as claimed in claim 38 wherein step (d) further comprises the step of gathering data from in-patient, ambulatory and ancillary claims for each patient.

44. The process as claimed in claim 38 wherein step (d) further comprises the step of gathering relevant information during the treatment episode, regardless of treatment duration, including provider data, CPT code data and diagnosis code data.

45. The process as claimed in claim 38 further comprising the step of outputting and discontinuing processing of invalid data records and comparing diagnosis and treatment code data.

46. The process as claimed in claim 38 further comprising the step of flagging valid claim records with a diagnosis code.

47. The process as claimed in claim 38 further comprising the step of resetting the predefined time window of the medical episode when a second at least one of a plurality of data records matches an open medical episode the predefined time window being reset for an



additional period of time until no other data records are grouped to the open medical episode within the reset predetermined time windows.

48. The process as claimed in claim 47, wherein step of resetting the predefined time window of the medical episode further comprises the step of selecting a most recent claim record if more than one matched claim record exists.

49. The process as claimed in claim 38, further comprising the step of identifying medical care providers treating a patient in similar episode treatment categories by Primary Care Physician.

50. A computer-implemented process for processing medical claims including the steps of:

- (a) reading a first patient's medical claim data, input as at least one of a plurality of data records, into a computer memory;
- (b) validating each of the at least one of a plurality of data records for at least one of a diagnosis code and a treatment code;
- (c) reading at least one pre-defined relation between the at least one of a diagnosis code and a treatment code in the validated at least one of a plurality of data records and pre-defined medical episodes; and
- (d) grouping the validated at least one of a plurality of data records to at least one of a plurality of episode treatment groups, each of the at least one of a plurality of episode treatment groups further comprising an episode treatment group identifier, a most recent anchor from date of treatment and a most recent sequential anchor record count.

51. The process as claimed in claim 50, further comprising the step of outputting and discontinuing processing of invalid data records and comparing diagnosis and treatment code data.

52. The process as claimed in claim 50, further comprising the step of flagging valid claim records with a diagnosis code identifier.

53. The process as claimed in claim 50, further comprising the step of resetting the dynamic time window of the medical episode when a second at least one of a plurality of data records matches an open medical episode, the dynamic time window being reset for an additional period of time until no other data records are grouped to the open medical episode within the reset dynamic time window.

54. The process as claimed in claim 53, wherein the step of resetting the dynamic time window of the medical episode, further comprises the step of selecting a most recent claim record if more than one matched claim record exists.

55. The process as claimed in claim 50, further comprising the step of identifying medical providers treating episodes treatment groups by identifying each episode treatment group by Primary Care Physician.

#### **REMARKS**

##### **A. Amendment To Drawings & Specification**

In accordance with 37 C.F.R. 1.121, the following remarks are submitted in support of this amendment. Specifically, Applicants have amended the patent specification, claims and drawing figure 12.

There are a number of amendments made to the specification which are editorial in nature. Accordingly, no support need to be given for such amendments. One editorial amendment in particular is an amendment on page 66 of the original application which consists of moving lines 12–19 of page 66 to page 65, between lines 13 and 14. This editorial amendment prompted the modification to the flow of information illustrated in revised figure 12.

There are also editorial amendments to the specification wherein information disclosed in the source code portion of the specification is again recited in the non–microfiche text portion of the specification. Applicant refers the Examiner to page 1 of the application which references the source code filed along with this application as a microfiche appendix.

In an effort to add clarity to the Application, Applicant has submitted a substitute specification which includes the above referenced amendments to the specification. The substitute specification is also accompanied by a statement that it contains no new matter.

##### **B. Amendment To Claims & Declaration of Interference**

New claims 38–55 have been copied from U.S. Patent No. 5,835,897 (hereinafter referred to as “the ‘897 patent”) for the purpose of provoking an interference with the patent. The present application has a priority filing date of June 23, 1994. Accordingly, Applicant is the senior party in accordance with 37 C.F.R. § 1.601(m), and prima facie entitled to judgement of priority with respect to the effective filing date of U.S. Patent No. 5,835,897 and thereby entitled to a judgement relative to the patentee.

In accordance with 37 CFR § 1.608, the following is an application of the terms of the copied claims to the specification of the present application, which has been submitted in revised form concurrent herewith.

<b><i>NEW CLAIMS</i></b>	<b><i>APPLICATION DISCLOSURE</i></b>
38. (Patent claim 1) A computer–implemented process for processing medical claims including the steps of:	Page 1 lines 10–12, Page 24 lines 27–28, Page 39 lines 25–33.
(a) reading a medical claim data, input as at least one of a plurality of data records, into a computer memory;	Page 26, lines 1–18, & 28–31, Page 27, lines 1–17, FIGs. 1, 6 & 10
(b) validating each of the at least one of a plurality of data records for at least one of a diagnosis code and a treatment code;	Page 27 lines 18–32, Page 28 lines 1–10
(c) reading at least one pre–defined relationship between the at least one of a diagnosis code and a treatment code in the validated at least one of a plurality of data records and pre–defined episode treatment categories; and	Page 10, lines 8–33, Page 11, Page 28, lines 11–16, Page 30, lines 8–30, FIGs. 9 & 12
(d) grouping the validated at least one of a plurality of data records to an episode treatment category based upon the pre–defined relationship, each episode treatment category having a dynamic time window defining a time period during which validated at least one of plurality of data records may be grouped to an episode treatment category.	Page 14, lines 1–18, Page 30, lines 35–36, Page 31, lines 1–25, FIG 12.
39. (Patent Claim 2) The process as claimed in claim 38 wherein the step (e) further includes the step of assigning treatment and cost information to the episode treatment category.	Page 34 lines 18–33.
40. (Patent Claim 3) The process as claimed in claim 38 wherein the step (e) further includes the step of classifying the patient records into at least one of a	Page 14, lines 1–18, Page 30, lines 35–36, Page 31, lines 1–25, FIG 12.

<b><u>NEW CLAIMS</u></b>	<b><u>APPLICATION DISCLOSURE</u></b>
plurality of episode treatment groups each of the plurality of episode treatment groups being defined by an episode treatment category.	
41. (Patent Claim 4) The process as claimed in claim 40 wherein the episode treatment groups further comprise clinically homogeneous groupings with respect to the underlying cause of illness and treatment requirement.	Page 28 line 18 – Page 30, line 4.
42. (Patent Claim 5) The process as claimed in claim 40 wherein an active and open episode treatment group comprises an episode treatment group number, sequential episode number, and most recent anchor date of treatment.	Inherent pages at 30–31. An episode treatment group number is the same as an interrelated index code. Because episodes are in date order, and for a specific patient, it is inherent that sequential episode number could be tracked. Anchor records represent service by a clinician engaging in the direct evaluation, management or treatment of a patient. The present application tracks the date of such records inherently because these are the only type of records that can begin an episode of care.
43. (Patent Claim 14) The process as claimed in claim 38 wherein step (d) further comprises the step of gathering data from in-patient, ambulatory and ancillary claims for each patient.	Page 26, lines 1–18, & 28–31, Page 27, lines 1–17. The HCFA 1500 gives rise to ambulatory and ancillary claims. The UB 82 & UB 92 refer to the in-patient claims.
44. (Patent Claim 15) The process as claimed in claim 38 wherein step (d) further comprises the step of gathering relevant information during the treatment episode, regardless of treatment duration, including provider data, CPT code data and diagnosis code data.	Page 35 line 7 – Page 39 line 23.
45. (Patent Claim 16) The process as claimed in claim 38 further comprising the step of outputting and discontinuing processing of invalid data records and comparing diagnosis and treatment code data.	Page 27, line 22–27, Page 11, lines 13–16, Page 35 line 7 – Page 39 line 23.
46. (Patent Claim 19) The process as claimed in claim 38 further comprising the step of flagging valid claim records with a diagnosis code.	Page 10 lines 8–12, Page 27, line 22–27.
47. (Patent Claim 21) The process as claimed in claim 38 further comprising the	Page 31, lines 1–12, Page 30 lines 35–36.

<b><u>NEW CLAIMS</u></b>	<b><u>APPLICATION DISCLOSURE</u></b>
step of resetting the predefined time window of the medical episode when a second at least one of a plurality of data records matches an open medical episode the predefined time window being reset for an additional period of time until no other data records are grouped to the open medical episode within the reset predetermined time windows.	
48. (Patent Claim 22) The process as claimed in claim 47, wherein step of resetting the predefined time window of the medical episode further comprises the step of selecting a most recent claim record if more than one matched claim record exists.	Page 31, lines 1–12. This step is inherent in the process of comparing the record immediately preceding it, because if two matches occur, and one is most recent, the two records will be compared against each other and thereby extends the window based on the match and comparison of those two records. Also, if more than one matched claim exists, the time window is inherently reset off the most recent of the matched time records.
49. (Patent Claim 26) The process as claimed in claim 38, further comprising the step of identifying medical care providers treating a patient in similar episode treatment categories by Primary Care Physician.	Page 35 line 7 – Page 39 line 23.
50. (Patent Claim 33) A computer–implemented process for processing medical claims including the steps of:	Page 1 lines 10–12, Page 24 lines 27–28, Page 39 lines 25–33.
(a) reading a first patient's medical claim data, input as at least one of a plurality of data records, into a computer memory;	Page 26, lines 1–18, & 28–31, Page 27, lines 1–17, FIGs. 1, 6 & 10
(b) validating each of the at least one of a plurality of data records for at least one of a diagnosis code and a treatment code;	Page 27 lines 18–32, Page 28 lines 1–10
(c) reading at least one pre–defined relation between the at least one of a diagnosis code and a treatment code in the validated at least one of a plurality of data records and pre–defined medical episodes; and	Page 10, lines 8–33, Page 11, Page 28, lines 11–16, Page 30, lines 8–30, FIGs. 9 & 12
(d) grouping the validated at least one of a plurality of data records to at least one of a plurality of episode treatment groups further comprising an episode treatment group identifier, a most recent anchor from date of treatment and a most recent	Page 14, lines 1–18, Page 30, lines 16–18 & lines 35–36, Page 31, lines 1–25, FIG 12. Anchor records represent service by a clinician engaging in the direct evaluation, management or treatment of a patient. All episodes of care have “Anchor” records,

<u><b>NEW CLAIMS</b></u>	<u><b>APPLICATION DISCLOSURE</b></u>
sequential anchor record count.	because they are required to begin and reset time windows. Also, the anchor record count is inherent in the system by virtue the system tracking each anchor record.
51. (Patent Claim 38) The process as claimed in claim 50, further comprising the step of outputting and discontinuing processing of invalid data records and comparing diagnosis and treatment code data.	Page 27, line 22–27, Page 35 line 7 – Page 39 line 23.
52. (Patent Claim 41) The process as claimed in claim 50, further comprising the step of flagging valid claim records with a diagnosis code identifier.	Page 10 lines 8–12, Page 27, line 22–27.
53. (Patent Claim 43) The process as claimed in claim 50, further comprising the step of resetting the dynamic time window of the medical episode when a second at least one of a plurality of data records matches an open medical episode, the dynamic time window being reset for an additional period of time until no other data records are grouped to the open medical episode within the reset dynamic time window.	Page 31, lines 1–12.
54. (Patent Claim 44) The process as claimed in claim 53, wherein the step of resetting the dynamic time window of the medical episode, further comprises the step of selecting a most recent claim record if more than one matched claim record exists.	Page 31, lines 1–12. This step is inherent in the process of comparing the record immediately preceding it, because if two matches occur, and one is most recent, the two records will be compared against each other and thereby extend the window based on the match and comparison of those two records.
55. (Patent Claim 48) The process as claimed in claim 50, further comprising the step of identifying medical providers treating episodes treatment groups by identifying each episode treatment group by Primary Care Physician.	Page 35 line 7 – Page 39 line 23.

### **Applicant's Prima Facie Case of Priority**

In accordance with 37 C.F.R. Sec. 1.608(a), Applicant Attorney of record, undersigned below, respectfully submits that there is a basis upon which the Applicant is entitled to judgement relative to the patentee. U.S. Patent No. 5,835,897 has a filing date of June 22, 1995. This application is a continuation patent application of United States Patent Application Serial No. 08/539,413, which was filed on October 5, 1995. The present application claims priority to United States Patent Application Serial No. 08/539,413. United States Patent Application Serial No. 08/539,413 is a divisional patent application of United States Patent Application Serial No. 08/244,795, which was filed on June 23, 1994. United States Patent Application Serial No. 08/539,413 claims priority to United States Patent Application Serial No. 08/244,795. Because the present application claims priority to United States Patent Application Serial Nos. 08/244,795 and 08/539,413, it has a priority filing date of June 23, 1994. Accordingly, Applicant is the senior party and thereby entitled to judgement relative to the patentee.

### **Proposed Count**

Applicant proposes the following count for a Declaration of Interference between the present Application and U.S. Patent No. 5,835,897:

#### **COUNT**

A computer-implemented process for processing medical claims including the steps of:

- (a) reading a medical claim data, input as at least one of a plurality of data records, into a computer memory;
- (b) validating each of the at least one of a plurality of data records for at least one of a diagnosis code and a treatment code;
- (c) reading at least one pre-defined relationship between the at least one of a diagnosis code and a treatment code in the validated at least one of a plurality of data records and pre-defined episode treatment categories; and
- (d) grouping the validated at least one of a plurality of data records to an episode treatment category based upon the pre-defined relationship, each episode treatment category having a dynamic time window defining a time period during which validated at least one of plurality of data records may be grouped to an episode treatment category.

The above count corresponds exactly to claim 38 of this Application and claim 1 of the '897 patent. The Applicant proposes that claims 38-55 of this application and claims 1-5, 14-

16, 19, 21, 22, 26, 33, 38, 41, 43, 44 and 48 of the '897 patent be designated as corresponding to the count.

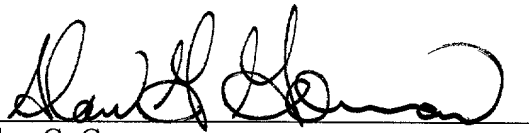
### CONCLUSION

As shown above and in the supporting affidavits and documentary evidence, the Applicant is *prima facie* entitled to priority of the invention of the claims of the '897 patent. Therefore, the Applicant respectfully requests that an interference be declared with claims 38-55 of this application and claims 1-5, 14-16, 19, 21, 22, 26, 33, 38, 41, 43, 44 and 48 of the '897 patent be designated as corresponding to the above proposed count. Please charge fees for the extra claims to Deposit Account No. 13-2725. Any questions concerning this matter may be directed to the undersigned at 612-371-5219.

Respectfully submitted,

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Dated: November 10, 1999

  
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AGG:cmf



1                   **METHOD AND SYSTEM FOR GENERATING**  
2                   **STATISTICALLY-BASED MEDICAL PROVIDER**  
3                   **UTILIZATION PROFILES**

4  
5  
6   **MICROFICHE APPENDIX.** This specification includes a  
7   Microfiche Appendix which includes 1 page of microfiche with  
8   a total of 37 frames. The microfiche appendix includes  
9   computer source code of one preferred embodiment of the  
10   invention. In other embodiments of the invention, the  
11   inventive concept may be implemented in other computer code,  
12   in computer hardware, in other circuitry, in a combination of  
13   these, or otherwise. The Microfiche Appendix is hereby  
14   incorporated by reference in its entirety and is considered  
15   to be a part of the disclosure of this specification.

16  
17   **I. BACKGROUND OF INVENTION**

18       **A. Field of the Invention**

19       The invention relates to methods and systems for analyzing  
20   medical claims histories and billing patterns to  
21   statistically establish treatment utilization patterns for  
22   various medical services. Data is validated using  
23   statistical and clinically derived methods. Based on  
24   historical treatment patterns and a fee schedule, an accurate  
25   model of the cost of a specific medical episode can be  
26   created. Various treatment patterns for a particular  
27   diagnosis can be compared by treatment cost and patient

outcome to determine the most effective treatment approach.  
It is also possible to identify those medical providers who  
provide treatment that does not fall within the statistically  
established treatment patterns or profiles.

#### B. The Background Art

It is desirable to compare claims for reimbursement for  
medical services against a treatment pattern developed from a  
large body of accurate medical provider billing history  
information. Although in the prior art some attempt was made  
to compare claims for reimbursement for medical services to a  
normative index, the prior art did not construct the  
normative index based on actual clinical data. Rather, the  
prior art based the normative index on a subjective  
conception (such as the medical consensus of a specialty  
group) of what the proper or typical course of treatment  
should be for a given diagnosis. Such prior art normative  
indices tended to vary from the reality of medical practice.  
In the prior art, automated medical claims processing  
systems, systems for detecting submission of a fraudulent  
medical claims, and systems for providing a medical baseline  
for the evaluation of ambulatory medical services were known.  
Documents which may be relevant to the background of the  
invention, including documents pertaining to medical  
reimbursement systems, mechanisms for detecting fraudulent

1 medical claims, and related analytical and processing  
2 methods, were known. Examples include: United States Patent  
3 No. 4,858,121, entitled "Medical Payment System" and issued  
4 in the name Barber et al. on August 15, 1989; No. 5,253,164,  
5 entitled "System and Method for Detecting Fraudulent Medical  
6 Claims Via Examination of Service Codes" and issued in the  
7 name of Holloway et al. on October 12, 1993; No. 4,803,641,  
8 entitled "Basic Expert System Tool" and issued in the name of  
9 Hardy et al. on February 7, 1989; No. 5,658,370, entitled  
10 "Knowledge Engineering Tool" and issued in the name of Erman  
11 et al. on April 14, 1987; No. 4,667,292, entitled "Medical  
12 Reimbursement Computer System" and issued in the name of  
13 Mohlenbrock et al. on May 19, 1987; No. 4,858,121, entitled  
14 "Medical Payment System" and issued in the name of Barber et  
15 al. on August 15, 1989; and No. 4,987,538, entitled  
16 "Automated Processing of Provider Billings" and issued in the  
17 name of Johnson et al. on January 22, 1991, each of which is  
18 hereby incorporated by reference in its entirety for the  
19 material disclosed therein.

20 Additional examples of documents that may be relevant to  
21 the background of the invention are: Leape, "Practice  
22 Guidelines and Standards: An Overview," ORB (Feb. 1990);  
23 Jollis et al., "Discordance of Databases Designed for Claims  
24 Payment versus Clinical Information Systems," Annals of  
25 Internal Medicine (Oct. 15, 1993); Freed et al., "Tracking

1 Quality Assurance Activity," American College of Utilization  
2 Review Physicians (November, 1988); Roberts et al., "Quality  
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4 Physicians (November, 1988), Rodriguez, "Literature Review,"  
5 Quality Assurance and Utilization Review - Official Journal  
6 of the American College of Medical Quality (Fall 1991);  
7 Elden, "The Direction of the Healthcare Marketplace," Journal  
8 of the American College of Utilization Review Physicians  
9 (August 1989); Rodriguez, "Literature Review," Quality  
10 Assurance and Utilization Review - Official Journal of the  
11 American College of Medical Quality (Fall 1991); Roos et al.,  
12 "Using Administrative Data to Predict Important Health  
13 Outcomes," Medical Care (March 1988); Burns et al., "The Use  
14 of Continuous Quality Improvement Methods in the Development  
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24 in a Quality Improvement Model," ORB (February, 1990); Borbas  
25 et al., "The Minnesota Clinical Comparison and Assessment

1 Project," ORB (February, 1990); Weiner et al., "Applying  
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8 al., "Using the Analytic Hierarchy Process (AHP) to Develop  
9 and Disseminate Guidelines," ORB (December, 1992); Hadorn et  
10 al., "An Annotated Algorithm Approach to Clinical Guideline  
11 Development," JAMA (June 24, 1992); Falconer et al., "The  
12 Critical Path Method in Stroke Rehabilitation: Lessons from  
13 an Experiment in Cost Containment and Outcome Improvement,"  
14 ORB (January, 1993); Reinertsen, "Outcomes Management and  
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16 ORB (January, 1993); Mennemeyer, "Downstream Outcomes: Using  
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18 Laboratory Testing," ORB (June, 1991); Iezzoni, "Using  
19 Severity Information for Quality Assessment: A Review of  
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24 Practice (1993); Lawless, "A Managed Care Approach to  
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1     - Official Journal of the American College of Utilization  
2     Review Physicians (May, 1990); Dragalin et al., "Institutes  
3     for Quality: Prudential's Approach to Outcomes Management for  
4     Specialty Procedures," ORB (March, 1990); Chinsky, "Patterns  
5     of Treatment Ambulatory Health Care Management, Physician  
6     Profiling - The Impact of Physician, Patient, and Market  
7     Characteristics On Appropriateness of Physician Practice in  
8     the Ambulatory Setting," (Doctoral Dissertation, The  
9     University of Michigan, 1991), published by Concurrent Review  
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11    California; "Patterns of Treatment Ambulatory Health Care  
12    Management, Implementation Guide," published by Concurrent  
13    Review Concurrent Review Technology, Inc., Shingle Springs,  
14    California; "Patterns of Treatment Ambulatory Health Care  
15    Management, Patterns Processing Model," published by  
16    Concurrent Review Concurrent Review Technology, Inc., Shingle  
17    Springs, California; Report on Medical Guidelines & Outcome  
18    Research, 4 (February 11, 1993); "Practice Guidelines - The  
19    Experience of Medical Specialty Societies," United States  
20    General Accounting Office Report to Congressional Requestors  
21    (GAO/PEMD-91-11 Practice Guideline) (February 21, 1991);  
22    "Medicare Intermediary Manual Part 3 - Claims Process,"  
23    Department of Health and Human Services, Health Care  
24    Financing Administration, Transmittal No. 1595 (April 1993);  
25    CCH Pulse The Health Care Reform Newsletter (April 19, 1993);

1 Winslow, "Report Card on Quality and Efficiency of HMOs May  
2 Provide a Model for Others," The Wall Street Journal; Jencks  
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20 Showstack, "Episode-of-Care Physician Payment: A Study of  
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22 1987); Schappert, "National Ambulatory Medical Survey: 1989  
23 Summary," Vital and Health Statistics, U.S. Department of  
24 Health and Human Services, Public Health Service, Centers for  
25 Disease Control, National Center for Health Statistics

(April, 1992) (DHHS Publication No. [PHS] 92-1771); Graves,  
"Detailed Diagnoses and Procedures, National Hospital  
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Service, Centers for Disease Control, National Center for  
Health Statistics (June, 1992) (DHHS Publication No. [PHS]  
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1 United States (1991) (published by U.S. Department of Health  
2 and Human Services, Public Health Service, Centers for  
3 Disease Control, National Center for Health Studies), each of  
4 which is hereby incorporated by reference in its entirety for  
5 the material disclosed therein.

6 Additional background materials to which the reader is  
7 directed for both background and to refer to while studying  
8 this specification include: Physicians' Current Procedural  
9 Terminology CPT '94, published by American Medical  
10 Association, Code it Right Techniques for Accurate Medical  
11 Coding, published by Medicode Inc., HCPCS 1994 Medicare's  
12 National Level II Codes, published by Medicode Inc., Med-  
13 Index ICD 9 CM Fourth Edition 1993, published by Med-Index,  
14 each of which is hereby incorporated by reference in its  
15 entirety for the material disclosed therein.

## 16 17 II. SUMMARY OF THE INVENTION

18 It is an object to provide a mechanism for assessing  
19 medical services utilization patterns. The invention  
20 achieves this object by allowing comparison processing to  
21 compare an individual treatment or a treatment group against  
22 a statistical norm or against a trend.

23 It is an object of the invention to provide a mechanism  
24 for converting raw medical providers billing data into an  
25 informative historical database. The invention achieves this

object by read, analyze and merge ("RAM") processing coupled with claims edit processing to achieve a reliable, relevant data set.

It is an object of the invention to provide a mechanism for accurately determining an episode of care. The invention achieves this object by providing a sequence of steps which, when performed, yield an episode of care while filtering out irrelevant and inapplicable data.

It is an object of the invention to provide a method for performing a look-up of information, that is, providing a mechanism for gaining access to different parts of the informational tables maintained in the database. This object is achieved by reviewing the referenced tables for specific codes representing specific diagnoses. The codes are verified for accuracy. Then tables are accessed to display selected profiles. Users are then given the opportunity to select profiles for comparison.

It is an object of the invention to provide a method for comparing profiles. This object is achieved by comparing index codes against historical reference information stored in the parameter tables. Discovered information is checked against defined statistical criteria in the parameter tables. The process is repeated for each index code and its profile developed in the history process as many times as necessary to complete the information gathering.

1        It is an object of the invention to create, maintain and  
2        present to the user a variety of report products. These  
3        reports are provided either on-line or in a hard copy format.  
4        The process of creating, maintaining and presenting these  
5        reports is designed to present relevant information in a  
6        complete and useful manner.

7        It is an object of the invention to provide a mechanism  
8        for creating a practice parameter database. This object is  
9        achieved in the invention by repetitive episode of care  
10       processing and entry of processed episode of care data into a  
11       data table until the populated data table becomes the  
12       practice parameter database.

### 14       III. BRIEF DESCRIPTION OF THE DRAWINGS

15       Figure 1 depicts steps performed in the method of the  
16       invention to establish a practice parameter or utilization  
17       profile for a particular diagnosis.

18       Figure 2 depicts an episode of care for a single disease.

19       Figure 3 depicts an episode of care for concurrent  
20       diseases.

21       Figure 4 depicts potential outcomes for an episode of  
22       care.

23       Figure 5 depicts phases of an episode of care.

24       Figure 6-8 depicts processing of data before episode of  
25       care processing begins.

Figure 9 depicts episode of care processing.

Figure 10 depicts principle elements of the invention and their relationship to each other.

Figure 11 depicts the process of the preferred embodiment of the Read, Analyze, Merge element of the invention.

Figure 12 depicts the process of the preferred embodiment of the Episode of Care element of the invention.

Figure 13 depicts the process of the preferred embodiment of the Look-up element of the invention.

Figure 14 depicts the process of the preferred embodiment of the Subset Parameter Look-up component of the Look-up element of the invention.

Figure 15 depicts the process of the preferred embodiment of the Profile Comparison element of the invention.

#### IV. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention includes both a system and a method for analyzing healthcare providers' billing patterns, enabling an assessment of medical services utilization patterns. When the invention is employed, it can readily be seen whether a provider or multiple providers are overutilizing or underutilizing services when compared to a particular historical statistical profile. The statistical profile of the invention is a statically-derived norm based on clinically-validated data which has been edited to eliminate

erroneous or misleading information. The profiles may be derived from geographic provider billing data, national provider billing data, the provider billing data of a particular payor entity (such as an insurance company) or various other real data groupings or sets. Twenty informational tables are used in the database of the preferred embodiment of the invention. These include a Procedure Description Table, ICD-9 Description Table, Index Table, Index Global Table, Index Detail Table, Window Table, Procedure Parameter Table, Category Table, Qualifying Master Table, Specialty Table, Zip/Region Table, Family Table, Specialty Statistic Table, Age/Gender Statistic Table, Region Statistic Table, Qualifying Index Table, Qualifying Group Table, Category Parameter Table, Duration Parameter Table and Family Table. ICD 9 codes or ICD (International Classification of Diseases, generically referred to as a disease classification) codes as they are generally referred to herein are used in the preferred embodiment. In other embodiments of the invention other codes could be used, such as: predecessors or successors to ICD codes or substitutes therefor, such as DSM 3 codes, SNOWMED codes, or any other diagnostic coding schemes. These tables are described in detail as follows. It should be noted, however, that these tables describe are used by the inventors in one implementation of the invention, and that the inventive

1 concept described herein may be implemented in a variety of  
2 ways.

2025 RELEASE UNDER E.O. 14176

## PROCEDURE DESCRIPTION TABLE

This table identifies and validates five years of both CPT (Current Procedural Terminology, generically referred to as an identifying code for reporting a medical service) and HCPCS level II procedure codes. The lifetime occurrence maximum and follow-up days associated with a procedure code are also located in this table.

Code(Key)	Alpha/Numeric	5	Standard CPT or HCPCS(5 Years including Modifiers)
Sub-Code	Character	2	* = Starred Procedures N = New Codes Current Year D1 = Deleted Code Current Year D2 = Deleted Code Previous Year D3 = Deleted Code Third Year D4 = Deleted Code Fourth Year C = Changed Description
Life Time Occurrence	Numeric	2	Number = Count of occurrence in a lifetime Blank = Not applicable
Follow Up Days	Numeric	3	Number of Follow up Days to procedure.
Description	Character	48	Standard abbreviated description

Total

60

1       USE:

- 2       ● This table can validate CPT and HCPCs codes.
- 3       ● Five years of codes will be kept.
- 4       ● Give a brief description of the code.
- 5       ● Gives the maximum number of occurrences that this code can
- 6       be done in a lifetime, if applicable. (Programming not
- 7       addressed, to date)
- 8       ● Give the number of follow up days to a procedure.
- 9       (Programming not addressed, to date)
- 10      ● Modifiers are stored in this table with a "099"
- 11      prefix(i.e., the 80 modifier is "09980") with a
- 12      description of the modifier.
- 13      ● This table interrelates with:
- 14      - Parameter Tables
- 15      - Category Table
- 16      - Qualifying Tables
- 17      - Specialty Table
- 18      - CPT Statistic Table

19      SOURCE:

20      This table is taken from the TB\_PROC table from gendbs

21      from prod1. The occurrence field is maintained by the

22      Medicode staff.

23



## ICD-9 DESCRIPTION TABLE

This table identifies and validates five years of diagnosis codes. It also contains a risk adjustment factor for each diagnosis.

ICD-9 Code(Key)	Alpha/Numeric	5	Left justified, assumed decimal after 3rd position
Sub-Code	Character	2	N = New Code D = Deleted Code C = Changed Code
Indicator	Character	1	* or blank * = code requires 4th and/or 5th digits to be specific
Risk	Alpha/Numeric	2	Overall Classification of Disease
Description	Character	48	Standard abbreviated description

Total 58

### USE:

- This table can validate ICD codes.
- Five years of codes will be kept.
- Give a brief description of the code.

- 1     ● Show if the code is incomplete and in need of a fourth or  
2       fifth digit.

3       An ICD code which should have a 4th and/or 5th digit is  
4       listed with an "\*".

- 5     ● This file interrelates with:

- 6       - Index Table  
7       - Index Detail Table  
8       - Index Global Table  
9       - Qualifying Master Table  
10       - Family Table  
11       - All Parameter Tables

12    SOURCE:

13       ICD codes and description fields are purchased from HCFA  
14       (Health Care Financing Administration located in Baltimore,  
15       Maryland).

16       The sub-code is maintained by the clinical staff.  
17

## INDEX DETAIL TABLE

This table groups ICD-9 codes into inclusive or exclusive diagnosis codes. This grouping is unique to each index code and is used to drive the search for each episode of care. ICD-9 codes have been classified into categories and given an indicator which determines whether or not the associated CPT code should be included in the episode of care. Also, an indicator may cause exclusion of any specific patient record from an episode of care summary analysis.

ICD-9	Alpha/Numeric or Character	5	Left justified assumed decimal after 3rd position.
Indicator	Character	2	I = Index code R = Related S = signs/symptoms RO = Rule out C = complications (exclude) M = miscoded V = Vcodes MI = Miscoded Index
ICD-9	Alpha/Numeric	5	ICD-9 Beginning Range Code
ICD-9	Alpha/Numeric	5	ICD-9 Ending Range Code
Update	Character	1	A, C, or Blank



- This file layout is used for drafting and populating a temporary file built from this table and the Index Global Table based on indicators and keys extrapolated from the Index table.

## PROGRAM LOGIC TO ASSIGN EPISODE OF CARE

- Any patient history with an ICD from the temp file for the chosen Index code is tagged for possible assignment of Episode of Care.
- Perform a search on patient history for any ICD code from temp file with an indicator of "C". If found, exclude entire patient history from EOC search.
- The qualifying tables are accessed to verify if specific qualifying factors apply to determine if patient history meets criteria for determination of valid episode of care. (See Qualifying Tables for further explanation)
- The qualifying table is then accessed for further delineation of qualifying circumstances by EOC.
- A timeline is tracked, by patient, for all potential Episodes of care that may occur for a given patient history.
- The data is arrayed based on profile classes which are eight subsets of Procedure categories. An aggregate of

all procedures can also be reported. (See Category Table  
for further explanation)

● This table interrelates with:

- ICD Description Table
- Index Table
- Index Global Table
- Parameter Table
- CPT Statistic Table
- Age/Sex Table

SOURCE:

This table is generated and maintained by the Medicode staff.

## INDEX TABLE

This table provides a preliminary filter for assigning and accessing different tables during the Episode of Care process. This table houses the assignment of staging and whether or not the Index Global table should be accessed.

ICD-9	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Staging	Character	2	P = preventive A = acute C = chronic L = life threatening M = manifestations
Global Key	Alpha	2	C = complications M1 = miscoded medical vcodes M2 = miscoded surgical vcodes 1 = medical vcodes 2 = surgical vcodes
Indicator	Character	2	C = complications V = vcodes
Update	Character	1	A, C, or Blank

1       Total                               12

2       USE:

3       ● This table is used as a preliminary sort for Index codes  
4       before the EOC search.

5       ● Once an Index code has been selected, this table is  
6       searched for whether or not the global index table needs  
7       to be accessed.

8       ● This table assigns the staging for the index code which  
9       points to the window table.

10      ● This table interrelates with:

11       - ICD Description Table

12       - Index Detail Table

13       - Index Global Table

14       - Window Table

15      SOURCE:

16      This table is generated and maintained by the Medicode staff.

17



## INDEX GLOBAL TABLE

This table gives a listing of ICD-9 codes common to most Index codes for either inclusion such as preventive or aftercare, or exclusion such as medical complications.

GLOBAL KEY	Alpha/Numeric	2	C = complications M1 = miscoded medical vcodes M2 = miscoded surgical vcodes 1 = medical vcodes 2 = surgical vcodes
ICD Beginning	Alpha/Numeric	5	ICD-9 Beginning range code
ICD Ending	Alpha/Numeric	5	ICD-9 Ending range code
Update	Character	1	A, C, or Blank

Total 13

### USE:

- This table is used to identify a generic V Code or complication ICD code to be used in an EOC search for any Index code.
- It is triggered by the Index table.
- The surgical Vcodes include all M1, M2, 1 and 2's.
- Medical Vcodes include M1 and 1.
- A complication ICD code will negate the use of a patient from the EOC search.

1       ● A temporary file for the index code is created based on  
2       ICDs extrapolated from this table as well as the Index  
3       detail table

4       ● This table interrelates with:

- 5       - ICD Description Table
- 6       - Index Table
- 7       - Index Detail Table

8       SOURCE:

9       This table is generated and maintained by the Medicode  
10      staff.

## WINDOW TABLE

This table contains the number of days preceding and following an episode of care that must be present without any services provided to the patient relating to the index code or associated codes. These windows are used to define the beginning and end points of an episode of care. This table is driven from the staging field in the index table.

Staging Indicator	Character	2	P = Preventive C = Chronic, A = Acute L = Life threatening, M = Manifestation
Beginning Window	Numeric	3	Number of days for no occurrence of ICD for Index Code
Ending Window	Numeric	3	Number of days for no occurrence of ICD for Index Code
Update	Character	1	A, C, or Blank

Total 9

### USE:

- This table is keyed off of the staging and it tells the program how long of a "Clear Window" is needed on both ends of this EOC for it to be valid.

SOURCE: This table is generated and maintained by the PP staff.

## PROCEDURE PARAMETER TABLE

This table contains the specific CPT codes identified for each index code listed chronologically with associated percentiles, mode, and average. The end user may populate an identical table with their own unique profiles created by analyzing their claims history data.

ICD-9 Code	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Profile	Alpha/Numeric	2	Mnemonic
Procedure	Alpha/Numeric	5	CPT, HCPCS
timeframe	Alpha/Numeric	3	Mnemonic for timeframe or total
50th percentile	Numeric	4	Beginning percentile range
50th percentile	Numeric	4	ending percentile range
75th percentile	Numeric	4	beginning percentile range
75th percentile	Numeric	4	ending percentile range
95th percentile	Numeric	4	beginning percentile range
95th percentile	Numeric	4	ending percentile range
Mode	Numeric	3	Numeric Count
Count	Numeric	7	Number of EOCs for timeframe

Sum	Numeric	7	Number of services for timeframe
Weighting	Numeric	6	Numeric count, assumed decimal (4.2)
Update	Character	1	A, C, or Blank

Total 63

#### USE:

- This table shows which CPT's are statistically and historically billed and how often based on an index ICD code.
- It is keyed off of the index code and the category.

#### SOURCE:

- All of the field elements are obtained from the Procedure Detail Report.
- Weighting is to be addressed in Phase II of the product.

## CATEGORY PARAMETER TABLE

This table contains a listing of the categories identified for each index code listed chronologically with associated percentiles, mode, and average. The end user may populate an identical table with their own unique profiles created by analyzing their claim history data.

ICD-9 Code	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Profile	Alpha/Numeric	2	Mnemonic
Category	Alpha/Numeric	4	category
timeframe	Alpha/Numeric	3	Mnemonic of timeframe or total
50th percentile	Numeric	4	beginning percentile range
50th percentile	Numeric	4	ending percentile range
75th percentile	Numeric	4	beginning percentile range
75th percentile	Numeric	4	ending percentile range
95th percentile	Numeric	4	beginning percentile range
95th percentile	Numeric	4	and ending percentile range
Mode	Numeric	3	Numeric Count, assumed decimal (4.2)
Count	Numeric	7	Number of EOCs for the timeframe

Sum	Numeric	7	Number of services for the timeframe
Update	Character	1	A, C, or Blank

Total 56

#### USE:

- This table shows which categories are statistically and historically billed and how often based on an index ICD code.
- It is keyed off of the index code and the category.

#### SOURCE:

- All of the field elements are obtained from the Parameter Timeframe report.

## DURATION PARAMETER TABLE

This table contains the length of time associated with an episode of care for a given Index code. NOTE: The end user may populate an identical table with their own unique profiles created by analyzing their claims history data.

ICD-9	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Profile	Alpha/Numeric	2	Mnemonic
50th percentile	Numeric	4	beginning range
50th percentile	Numeric	4	ending range
75th percentile	Numeric	4	beginning range
75th percentile	Numeric	4	ending range
95th percentile	Numeric	4	beginning range
95th percentile	Numeric	4	ending range
Mode	Numeric	3	beginning and ending range
Update	Character	2	A = Add C = Change

Total

36

USE:



- This table stores the projected length of an episode of care for a given index code.
- It interrelates with:
  - Index Detail table
  - Parameter table
- It is populated from the statistical analysis for each Index code.

## CATEGORY TABLE

This table provides a grouping of CPT codes into categories of similar services.

Category	Alpha/Numeric	4	Mnemonics
CPT	Alpha/Numeric	5	Beginning CPT Range
CPT	Alpha/Numeric	5	Ending CPT Range
Update	Character	1	A, C, or Blank

Total 15

### USE:

- Procedure codes have been categorized according to most likely type of service they may represent. It could be characterized as a sorting mechanism for procedure codes.
- The mnemonic used for this category is as follows:

E<sub>1</sub> = Major E and M

E<sub>2</sub> = Minor E and M

$L_1$  = Major Laboratory       $L_2$  = Minor Laboratory  
 $R_{D1}$  = Major Diagnostic Radiology       $R_{D2}$  = Minor Diagnostic  
Radiology  
 $R_{T1}$  = Major Therapeutic Radiology       $R_{T2}$  = Minor Therapeutic  
Radiology  
 $O_1$  = Major Oncology Radiology       $O_2$  = Minor Oncology  
Radiology  
 $M_{D1}$  = Major Diagnostic Medicine       $M_{D2}$  = Minor Diagnostic  
Medicine  
 $M_{T1}$  = Major Therapeutic Medicine       $M_{T2}$  = Minor Diagnostic  
Medicine  
 $S_{D1}$  = Major Diagnostic Surgery       $S_{D2}$  = Minor Diagnostic  
Surgery  
 $S_{T1}$  = Major Therapeutic Surgery       $S_{T2}$  = Minor Therapeutic  
Surgery  
 $A_1$  = Major Anesthesia       $A_2$  = Minor Anesthesia  
 $P_1$  = Pathology      J = Adjunct

- Categories are also used for arraying Episodes of Care into profile classes or can be reported as an aggregate. The subsets of the aggregate are:

0 Common Profile -  $A_1, A_2, P_1, E_1, E_2, L_1, L_2, R_{D1}, R_{D2}, M_{D1}, M_{D2}, S_{D1}, S_{D2}$ . (All of these categories are included as part of the other seven profile classes.

- 1        1    Surgery/Radiation/Medicine Profile - All Categories
- 2        2    Medicine/Radiation Profile -  $M_{T1}$ ,  $M_{T2}$ ,  $R_{T1}$ ,  $R_{T2}$ ,  $O_1$ ,  $O_2$
- 3        3    Surgery/Radiation Profile -  $S_{T1}$ ,  $S_{T2}$ ,  $R_{T1}$ ,  $R_{T2}$ ,  $O_1$ ,  $O_2$
- 4        4    Surgery/Medicine Profile -  $S_{T1}$ ,  $S_{T2}$ ,  $M_{T1}$ ,  $M_{T2}$
- 5        5    Radiation Profile -  $R_{T1}$ ,  $R_{T2}$ ,  $O_1$ ,  $O_2$
- 6        6    Medicine Profile -  $M_{T1}$ ,  $M_{T2}$
- 7        7    Surgery Profile -  $S_{T1}$ ,  $S_{T2}$

8

- 9        ●    This table interrelates with:
- 10       -    Parameter Table
- 11       -    Qualifying Tables
- 12       -    Procedure Table

13       SOURCE:

- 14       ●    Maintained by the clinical staff
- 15
- 16

## QUALIFYING MASTER TABLE

This table provides a preliminary filter for determining qualifying circumstances that may eliminate a patient history for determination of an Episode of Care. It also provides the initial sort of an episode of care for a specific profile class.

Index Code	Alpha/Numeric	5	Left justified, assumed decimal after 3rd position
Scope	Alpha	1	P = Patient E = Episode of Care B = Both
Profile	Alpha/Numeric	2	Mnemonic or Blank
Group	Alpha/Numeric	5	Correlates to group ID in Qualifying Group Table
Update	Character	1	A, C, or Blank
Total		14	

### Use:

- Preliminary select for where in EOC process qualifying circumstances should apply.
- This table interrelates with:
  - Index Detail Table

1           - Qualifying Group Table

2       Logic:

3       ● The Qualifying Master Table outlines the Index code, where  
4           in the data search the qualifying search is to occur and  
5           what qualifying groups are associated with the index code.  
6           The locations include P = patient search, E = Episode of  
7           Care search, or B = search in both.

8       ● The Profile field is numbered based on the 8 different  
9           profiles outlined under the category table. If blank, a  
10          profile is not relevant. They are as follows:

11       0. Common Profile

12       1. Surgery/Medicine/Radiation Profile

13       2. Medicine/Radiation Profile

14       3. Surgery/Radiation Profile

15       4. Surgery/Medicine Profile

16       5. Radiation Profile

17       6. Medicine Profile

18       7. Surgery Profile

19  
20  
21       ● The Group field assigns a 5 byte mnemonic that establishes  
22          a set of qualifying rule sets for a given index code.  
23          This field keys directly to the Qualifying Group Table.  
24          The majority of the groups relate to profile classes.  
25          They are as follows:

1 ALL (Surgery/Medicine/Radiation Profile)

2 MRPRO (Medicine/Radiation Profile)

3 SRPRO (Surgery/Radiation Profile)

4 SMPRO (Surgery/Medicine Profile)

5 RPRO (Radiation Profile)

6 MPRO (Medicine Profile)

7 SPRO (Surgery Profile)

8 CPRO (Common Profile)

9 There are 3 other groups which establish a set of  
10 qualifying circumstances based on the occurrence of a  
11 particular procedure or diagnosis. These are as follows:

12 SURG Certain Index codes are commonly associated with an  
13 invasive procedure which should be present during  
14 the course of treatment.

15 MED Certain Index codes are commonly associated with an  
16 E/M service which should be present during the  
17 course of treatment.

18 ONLY The Index code must occur at least twice on  
19 different dates of service over the course of  
20 treatment. This group looks only for this  
21 occurrence. No specific procedure is to be sought  
22 in conjunction with the Index code.

23 Source:

24 ● Table maintained by Clinical staff.

## QUALIFYING GROUP TABLE

Table groups certain qualifying circumstances to aid in an efficient search for data meeting the criteria.

Group	Alpha/Numeric	5	Left justified assumed decimal after 3rd position
Rule Type	Alpha/Numeric	2	II = Index Code specific rule IS = specific ICD code rule IC = multiple ICD to category rule CC = Multiple code rule CS = code specific rule IG = ICD to gender rule LA = ICD to age rule
Rule Identifier	Alpha/Numeric	1	T = True F = False (toggle) M = Male F = Female if IG rule type
Number required	numeric	2	number value
Update	Character	1	A, C, or Blank

Total

15

1  
2     USE:

- 3     ● To act as a preliminary qualifying mechanism for  
4       determining if claims information can be used in the  
5       assignment of a parameter.
- 6     ● This table interrelates with:
- 7       - Qualifying Index Table  
8       - Qualifying Code Table  
9       - Qualifying Master Table
- 10    ● A rule type (or rule types) is assigned by group  
11      delineating if the rule applies to a single or multiple  
12      ICD, single or multiple CPT or category or any combination  
13      thereof.
- 14    ● The rule identifier is an assigned mnemonic based on what  
15      the rule is to achieve.
- 16    ● The Logical indicates if the rule is positive or negative  
17      (inclusionary or exclusionary)
- 18    ● The number required is a count of the number of  
19      occurrences for the rule to be valid.

20    Logic:

- 21    ● The Group Id is driven by the groups assigned in the  
22      Qualifying master table. All qualifying rule sets  
23      assigned to a given group should be performed to determine  
24      the qualifying circumstances for a given index code. See  
25      Qualifying Master Table for an explanation of each group.



- The Rule Type is a mnemonic which assigns a common type of logic that is to be implemented in the search for the qualifying circumstances. It is possible that the same rule type could be associated with many different rule identifiers. The rule type will also point to either the Qualifying Index Table or the Qualifying Code Table as determined by the first byte of the file. The following is a listing of the rule types:

Rule Types associated with Qualifying Index Table:

II This rule is related directly to the Index code only.

IC This rule is for any indicated ICD code associated with the Index code as it relates to a category or procedure.

IS This rule is for a specific indicated ICD code associated with the Index code as it relates to a category or procedure.

IG This rule is for any indicated ICD code associated with the Index code as it relates to age. The age ranges to be used are:

0-1 = newborn/infant

1-4 = early childhood

5-11 = late childhood

12-17 = adolescence

18-40 = early adult

41-64 = late adult

1                   65-99 = geriatric

2                   12-50 = female childbearing age

3 Rule Types associated with Qualifying Code Table:

4 (Additional rule types may be added when necessary for phase

5 II of the product.)

6       CC This rule is for a specific procedure or category as it

7       relates to another specific procedure or category for

8       any ICD code associated with the Index code.

9       CS This is for a specific procedure or category as it

10       relates to a specific ICD code associated with the

11       Index code.

12 ● The Rule Identifier is a further break out of the

13 qualifying circumstances for a group. Most of the rule

14 Ids relate directly to components of a given profile to be

15 included or excluded. For example the rule ID of MMR

16 relates directly to the group of MRPRO and delineates that

17 the further breakout is for Radiation.

18 The other 3 major rule Ids relate directly to the

19 remaining 3 groups. These are:

20           Group	Rule ID
21           ONLY	O
22           SURG	S
23           MED	M

- The logical is a toggle for whether the rule is true or false. If the rule type is IG, the toggle is for Male or Female.
- The number required is a count for the minimum occurrence that the qualifying circumstance can occur.

SOURCE:

- To be maintained by clinical staff

## QUALIFYING INDEX TABLE

Table houses common qualifying circumstances based on presence or non-existence of given procedures and/or ICD codes that would qualify or disqualify a patient history in the determination of an Episode of Care.

Rule Type	Alpha/Numeric	2	II = Index Code specific rule IS = specific ICD code rule IC = multiple ICD to category rule IA = ICD to age rule EG = ICD to gender
Rule Identifier	Alpha/Numeric	4	assigned from Qualifying Master Table

Indicator	Alpha/Numeric	2	I = Index code R = Related S = signs/symptoms RO = Rule out M = miscoded V = Vcodes MI = Miscoded Index or Blank
Code	Alpha/Numeric	5	category, CPT, HCPCS, ICD or blank
Update	Character	1	A, C, or Blank

Total

14

#### USE:

- To act as a qualifying mechanism for determining if claims information can be used in the assignment of a parameter
- This table interrelates with:
  - Procedure Table
  - Category Table
  - Qualifying Group Table
  - ICD Description Table
  - Index Detail Table
- All rules generated from this table deal with an ICD code driven by the indicator, regardless of the Index code. If

1 the rule is ICD only, then the procedure is blank. If the  
2 rule is ICD and procedure, then the indicated ICD must  
3 correlate with a procedure code or category.

- 4 ● If the indicator is blank, then all indicators should be  
5 considered for qualifying circumstances. Listing a  
6 specific indicator causes a qualifying search on the  
7 associated indicator only.

8 Logic:

- 9 ● The first two fields of the Qualifying Index Table  
10 reiterates the rule type and rule identifier as outlined  
11 in the Qualifying Group table. Both of these fields are  
12 key.
- 13 ● The indicator correlates to the indicators in the Index  
14 Detail table. If the field is blank, all ICDs for the  
15 index code should be sought for the rule.
- 16 ● The code filed could be a CPT, HCPCS, category or ICD  
17 code. If this field is blank, no specific code or  
18 category should be sought for the rule.

19 SOURCE:

- 20 ● To be maintained by clinical staff

## QUALIFYING CODE TABLE

Table houses common qualifying circumstances based on the presence or non-existence of a given combination of procedure codes that would qualify or disqualify a patient history in the determination of an Episode of Care.

Rule Type	Alpha/Numeric	2	CC = Multiple code rule CS = code specific rule
Rule Identifier	Alpha/Numeric	4	As labeled in Qualifying Master Table
Primary code	Alpha/Numeric	5	CPT, HCPCS or category or ICD
Secondary Code	Alpha/Numeric	5	CPT, HCPCS or category or ICD
Update	Character	1	A, C, or Blank

Total

14

### USE:

- To act as a qualifying mechanism for determining if claims information can be used in the assignment of a parameter.
- This table interrelates with:
  - Procedure Table
  - Category Table
  - Qualifying Group Table
- All rules generated from this table have to do with a procedure or category driven by the qualifying master

1 table. The rule relates to the procedure or category as  
2 listed in the primary and secondary fields.

3 Logic:

- 4 ● The first two fields of the Qualifying Index Table  
5 reiterates the rule type and rule identifier as outlined  
6 in the Qualifying Group table. Both of these fields are  
7 key.
- 8 ● The Primary code is the driving code in the rule search  
9 for the qualifying circumstance. It can be a CPT, HCPCS,  
10 category or ICD code.
- 11 ● The Secondary code is the code that must be associated  
12 with the primary code in the rule search for the  
13 qualifying circumstance. It can be a CPT, HCPCS, category  
14 or ICD code.

15 SOURCE:

- 16 ● To be maintained by clinical staff.

## SPECIALTY TABLE

Table provides a listing of medical specialties with an assigned numeric identifier. This is standard HCFA information.

Specialty (Key)	Alpha/Numeric	3	Medicare specialty indicator
CPT	Alpha/Numeric	5	Beginning CPT to include
CPT	Alpha/Numeric	5	Ending CPT to include
Update	Character	1	A, C. or Blank

Total 14

### USE:

This table is used to specify which Specialty is most commonly used with which CPT.

A description of the specialty will be in the documentation.

### SOURCE:

This table will be taken from the list Med-Index Publications maintains (available from Medicode, Inc. located in Salt Lake City, Utah).



## ZIP/REGION TABLE

Table provides a listing of geographical zip codes sorted into 10 regional zones, standard HCFA information.

Region Indicator	Alpha/Numeric	2	Medicares Ten Regions
Zip Code	Numeric	5	Beginning Zip Code Range
Zip Code	Numeric	5	Ending Zip Code Range
Update	Character	1	A, C, or Blank

Total

13

### USE:

This table is used to specify which Medicare Region to use for the statistic table.

### SOURCE:

This will be generated by Medicode, Inc. staff.

## SPECIALTY STATISTIC TABLE

Table provides a listing of medical specialties with an assigned numeric identifier. This is standard HCFA information.

ICD-9 Code	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
------------	---------------	---	--

Specialty	Alpha/Numeric	3	
CPT Code	Alpha/Numeric	5	Beginning Range (Service Area)
CPT Code	Alpha/Numeric	5	Ending Range (Service Area)
Category	Alpha/Numeric	4	Mnemonic
Multiplier	Numeric	6	Implied decimal (4.2)
Update	Character	1	A, C, or Blank

Total 29

#### USE:

This table is a matrix that is directly tied to the parameter table by the index code. Its purpose is to give a numeric multiplier that is applied to the occurrence field in the parameter table, to vary the parameter by service area and/or sex and/or region. (i.e., if the occurrence is 2 and the multiplier for a specialist is 1.5, the specialist may receive a total of 3.)

If multiple multipliers are used, compute the average of them and use that.

#### SOURCE:

This table will be generated by the computer using the extended data set, and validated clinically by the clinical staff.

## AGE/GENDER STATISTIC TABLE

Table provides a listing of each CPT code for an index code with a numerical factor used to adjust the frequency of each code by age and/or gender specific data analysis.

ICD-9 Code	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Age	Alpha/Numeric	2	00-99
Sex	Alpha/Numeric	1	M, F or Blank
Category	Alpha/Numeric	3	Mnemonic
Multiplier	Decimal	6	Implied decimal (4.2)
Update	Character	1	A, C, or Blank

Total 18

### USE:

This table is a matrix that is directly tied to the parameter table by the index code. Its purpose is to give a numeric multiplier that is applied to the occurrence field in the parameter table, to vary the parameter by service area and/or sex and/or region. (i.e. if the occurrence is 2 and the multiplier for a male is 1.5, the male may receive a total of 3.)

It multipliers are used, compute the average of them and use that.

SOURCE:

This table will be generated by the computer using the extended data set, and validated clinically by the clinical staff.

## REGION STATISTIC TABLE

Table provides a listing of CPT code for an index code with a numerical factor used to adjust the frequency of each code by regional data analysis.

ICD-9 Code	Alpha/Numeric	5	Left justified assumed decimal after 3rd position.
Region	Alpha/Numeric	2	Medicares Ten Regions
Multiplier	Decimal	6	Implied decimal (4.2)
Update	Character	1	A, C, or Blank

Total	14
-------	----

**USE:**

This table is a matrix that is directly tied to the parameter table by the index code. Its purpose is to give a numeric multiplier that is applied to the occurrence

field in the parameter table, to vary the parameter by service area and/or sex and/or region. (i.e., if the occurrence is 2 and the multiplier for a region is 1.5, the region may receive a total of 3.) If multiple multipliers are used, compute the average of them and use that.

#### SOURCE:

This table will be generated by the computer using the extended data set, and validated clinically by the clinical staff.

### FAMILY TABLE

Table provides a listing of ICD-9 codes which have been clustered into family groupings.

Family Description	Character	24	Name of Family/Cluster
ICD-9 Code	Alpha/Numeric	5	Beginning ICD-9 Range
ICD-9	Alpha/Numeric	5	Ending ICD-9 Range

Total 34

#### USE:

This table is used for in-house purposes only. It provides a listing of a ICD Family/Cluster with a description of the Family/Cluster.

1 SOURCE:  
2 This table is generated and maintained by the clinical  
3 staff.  
4

20250101 14:00:00

## FILE LAYOUT FOR CLAIMS DATA CONTRIBUTION

We prefer Electronic Media Claims National Standard Format; however, if you are not using EMC the following is our suggested layout. Please include an exact layout of the format you use with your submission. The record layout that follows is for each line item that appears on a claim. The charge (field 19) should be the non-discounted fee-for-service. There should be no aggregation or fragmentation.

Field			Alpha/	
Number	Description	Length	Numeric	Comments
1.	Rendering Provider ID	15	A/N	Unique provider identification number or SSN
2.	Billing Provider ID	15	A/N	Unique provider identification number or SSN
3.	Provider Specialty	3	A/N	Supply a List of Specialty codes used
4.	Patient ID	17	A/N	Unique patient ID number or SSN. May be an encrypted or encoded format.
5.	DOB	8	N	Patient Date of Birth MMDDYY
6.	Sex	1	A	M = Male, F = Female
7.	Subscriber ID	25	A/N	Insured's I.D. No., Normality SSN
8.	Relationship	1	N	Patient to Subscriber, 1 = Self, 2 = Spouse, 3 = Dependent
9.	Bill ID	15	A/N	Unique claim/bill identification number
10.	From Date of Service	8	N	MMDDYY
11.	To Date of Service	8	N	MMDDYY
12.	Provider Zip	5	N	Standard 5 digit Zip Code
13.	Place of Service	2	A/N	Supply a list of POS codes used
14.	Type of Service	2	A/N	Supply a list of TOS codes used
15.	Procedure Code	5	N	Submitted CPT or HCPC code
16.	Modifier	2	N	Submitted CPT modifier
17.	2nd Modifier	2	N	If multiple modifiers are submitted, show the second modifier used. Anesthesia Modifiers (P1-P6)
18.	Claim type	3	A/N	Payor Class Code-W/C, HCFA, Medicaid etc.
19.	Charge	5	N	Billed amount, right justified, whole dollars
20.	Allowed Amount	5	N	Right justified, whole dollars

21.	# of days/units	5	N	number of days and/or units
22.	Anesthesia time	3	N	Actual Minutes
23.	ICD1	5	A/N	First diagnostic code attached to procedure
24.	ICD2	5	A/N	Second diagnostic code attached to procedure (Both ICD1 & ICD2 are left justified, assumed decimal after 3rd byte)
25.	ICD3	5	A/N	Third diagnostic code attached to procedure
26.	ICD4	5	A/N	Fourth diagnostic code attached to procedure
27.	Out-patient facility	5	A/N	Outpatient facility/outpatient.hospital identifier
28.	Revenue Code	3	N	Revenue center code

#### ACCEPTABLE MEDIA TYPES

- \* 9 track tape: 1600 or 6250 BPI, ASCII or EBCDIC, Labeled or Unlabeled, Unpacked data, Fixed record lengths
- \* Floppy disk; 3.5" (1.44Mb or 720K) or 5.25" (1.2Mb or 360K), Standard MS-DOS formatted disk, ASCII fixed record length or delimited file
- \* DC 600A or DC 6150 cartridge : "TAR" or single ASCII or EBCDIC file, Unpacked data, Fixed record lengths
- \* 8 mm Exabyte tape: "TAR" or single ASCII or EBCDIC file, Unpacked data, Fixed record lengths
- \* 3480 cartridge: Unpacked data, Fixed record lengths, Compressed or Uncompressed
- \* Maximum Block size 64,280

This invention is a process for analyzing healthcare providers' billing patterns to assess utilization patterns of medical services. The method of the invention incorporates a set of statistically derived and clinically validated episode of care data to be used as a paradigm for analyzing and comparing providers' services for specific diagnoses or medical conditions. This invention utilizes a series of processes to analyze the client's healthcare claims history to create unique parameters. In its preferred embodiment, the invention is implemented in software. The invention provides the following functions or tools to the client: creation of local profiles, display of profiles and comparison of profiles.



The creation of local profiles function gives the client the ability to develop unique episode of care profiles utilizing their own claims history data. The process for creating these profiles is identical to the process used in the development of the reference profiles.

The display of profiles function provides a look-up capability for information stored in the reference tables or in client generated profiles tables. This look-up capability may be displayed on the computer screen or viewed as a hard-copy print out.

The comparison of profiles function provides a comparison between any two profile sources with attention to variance between them. This includes comparing client specific profiles to reference tables, comparing a specific subset of the client's data (eg, single provider) against either reference tables or the client's profiles, or comparing different subsets of the client's profiles to subsets of reference tables.

There are four main processes involved in the invention, as depicted in figure 10. These are Read, Analyze and Merge (RAM), 1001, further depicted in figure 11; Episode of Care analysis (EOC), 1002, further depicted in figure 12; Look-up function, 1003, further depicted in figures 13 and 14; and Profile Comparison, 1004, further depicted in figure 15. The invention also includes an innovative reporting mechanism. Each of these four main processes and the reporting mechanism is described in detail in the remainder of this section.

#### A. Transforming Raw Data Into an Informative Database

1 Both the RAM and the EOC processes involve healthcare claims  
2 history search and analysis. The intent of the RAM and the EOC  
3 claims history processing is to enable the end user to establish  
4 their own unique profiles based on their existing claims data  
5 information. Developing a database of historical provider  
6 billing data which will be used to provide the functionality of  
7 the invention is the first step in the invention.

8 1. Read, Analyze and Merge ("RAM")

9 In order to define a profile a significant quantity of  
10 historical medical provider billing information must be analyzed.  
11 As indicated above, the provider billings may come from a variety  
12 of sources, with the general guideline that accuracy and  
13 completeness of the data and a statistically significant sample  
14 of provider billings required to develop a reliable profile. In  
15 the preferred embodiment of the invention, no less than two  
16 years' of consecutive claims history and about fifty million  
17 claims are used to develop the profiles. The RAM process  
18 verifies existence and validity of all data elements in a claims  
19 history before the data is processed to develop a profile. The  
20 reader is directed to Figures 1 and 6-8 for pictorial  
21 representations of the preferred embodiment of the invention.  
22 Figure 1 depicts the high level steps performed in one embodiment  
23 of the invention. The data flow shown in Figure 1 includes  
24 loading client data 101 from tape 100, reordering various fields  
25 103 and performing date of service expansion 104 as necessary.  
26 Next, data are merged (combined) 1-5 and sorted 106 to ensure all  
27 bill ID's are grouped together. The data 108 is then read,

analyzed and merged into an extended data set (EDS) 110. Reporting and any other processing may occur 111 and an Episode of Care database 112 is created. The preferred embodiment of this invention. In the preferred embodiment of the invention, the steps of the invention are implemented in a software product referred to as CARE TRENDS available from Medicode, Inc. of Salt Lake City, Utah.

Figure 6 depicts read, analyze and merge processing that occurs in the preferred embodiment of the invention. First, one claim at a time the data 603 is read 601, cross walked and scrubbed (filtered) 602. Then a claim is analyzed 604 with result output to a log file 605. The results in the log file 605 are then compared 606 to the original claim data and inserted 607 into an extended data set 608.

Figure 7 depicts an analytical process of the preferred embodiment that includes initializing 701 RVU and line number for each line of the claim and sorting 702 by RVU (descending) and CPT and charge in order to prepare for proper analysis by CES. Then 703 line items are split into two groupings of surgical assistant modifiers and all other modifiers in separate groups. Each of the two groups is then checked 704 against disease classification codes (ICD 9), procedure edits rules 705 (CES tables) and unbundle/rebundle edits 706 are performed.

Figure 8 depicts the merge process of the preferred embodiment of the invention. It includes reading 802 each line of from the log file for current bill, proceeding with processing if the record read is pertinent 804, determining whether to add

1 the record to the extended data set 805-807, (i.e. not adding  
2 denials, adding rebundles and adding other lines that have not  
3 been specifically excluded).

4 Figure 9 depicts episode of care formation in the preferred  
5 embodiment. This processing includes processing the records in  
6 the extended data set that relate to the current index code.  
7 This relation is determined by the index tables. Then the  
8 records are broken into potential episodes of care based on a  
9 period of time specified in a window table. Then the episode of  
10 care is qualified based on the rules in a qualifying table.  
11 Qualifying episodes of care are inserted into the episode of care  
12 table.

13 The following text includes a written description of the RAM  
14 processing that is performed in the preferred embodiment of the  
15 invention. Figure 11 shows the RAM process.

16 The first step in the RAM process is determination of a  
17 patient record, 1101. It is necessary to establish a patient  
18 record that can be used in the episode of care extraction process  
19 (explained in detail below). In the preferred embodiment, a  
20 patient record is identified as a unique patient history  
21 involving no less than two years of sequential claims history.  
22 Because identifying patient information is often removed from  
23 patient records to ensure patient confidentiality, patient  
24 information such as subscriber/relationship, patient ID, age,  
25 gender, bill ID and claim ID may be useful in positively  
26 identifying a particular patient. It should be noted that claims  
27 history data from various sources may need to be handled

1 differently to identify patient records due to differences in  
2 file organization and level of detail of information provided.  
3 The amount of information desired to be captured may vary in  
4 different embodiments of the invention, but generally the  
5 information to be captured is that on a standard HCFA 1500  
6 billing form, Electronic Media Claims, UB 82 or UB 92 claim  
7 forms, all of which are generally known in the industry.

8 The next step, 1102, is the manipulation of the client file  
9 layout to extrapolate or crosswalk the pertinent information in  
10 order to conform to the logic of the invention. Examples of this  
11 step include: translation of Type of Service or Benefits to  
12 Specialty type, modifiers, and/or place of service information.

13 The next steps involve the validation of claims elements.  
14 Each line item of claims history is compared against the  
15 Procedure, the Description table, (such as CPT or HCPCS  
16 description tables; HCPCS means Health Care Financing  
17 Administration Common Procedure Coding System provided by the  
18 U.S. Government; such tables generally are referred to as  
19 Description Tables and may contain any coding schemes) and the  
20 ICD description tables to validate the codes contained in the  
21 line item, 1103. Line items with an invalid code are not  
22 included in the remainder of RAM processing, though they are  
23 counted for future reference. Line items which indicate services  
24 being performed over a period of more than one day are expanded  
25 into numerous line items, one for each service performed, 1104.  
26 This function is also performed only on CPT codes 10000-99999.  
27 The services are then each given a unique date of service

beginning with the "date of service from" for the first line item and ending with the "date of service to" for the last line item. The last validation step, 1105, is the conversion of old CPT codes to new CPT codes. This step is essential to provide the most accurate statistics relative to physician office and hospital visits (termed Evaluation and Management Services).

The last step of the RAM process is to edit all claims for errors, through an appropriate claims edit tool, 1106. In the preferred embodiment, software known as "CLAIMS EDIT SYSTEM" which is available from Medicode, Inc. located in Salt Lake City, Utah is used to detect and correct any duplicate line items or inappropriately billed services. This results in an appropriately processed set of raw data that is now in a condition for episode of care processing. The reader is directed to the RAM source code in the Microfiche Appendix for all details of this processing performed in the preferred embodiment.

## 2. Determination of Episode of Care

The next step in transforming raw data into a useful database is to determine episodes of care for the data that has already undergone RAM processing. In the invention, a database is created which contains profiles for various diagnoses, chronic and otherwise, including complications indicators. Creation of the database depends on accurately defining an episode of care ("EOC") for each diagnosis. An episode of care is generally considered to be all healthcare services provided to a patient for the diagnosis, treatment, and aftercare of a specific medical condition. The episode of care window for a single disease is

1 depicted in Figure 2. In the simplicity of the figure, it can be  
2 seen that for the diagnosis in question, all healthcare services  
3 provided between onset and resolution should be incorporated into  
4 the database. An example of this would be a patient who has been  
5 afflicted with acute appendicitis. The patient's life prior to  
6 onset of the acute appendicitis would be considered a disease  
7 free state. On some date, the patient would notice symptoms of  
8 acute appendicitis (although he may not know the diagnosis) that  
9 cause him to seek the attention of a medical provider. That  
10 event would be considered the onset. During the disease state,  
11 numerous events may occur, such as the patient consulting a  
12 family practitioner, consulting a surgeon, laboratory work and  
13 surgical services being performed, and follow-up visits with the  
14 provider(s). When further follow-up is no longer required,  
15 resolution has been reached. Thus an episode of care has been  
16 defined and data from that patient's episode of care is used in  
17 the invention to construct a profile for the diagnosis applicable  
18 to that patient. Without the use of additional logic, however,  
19 the use of that definition of an episode of care would result in  
20 erroneous data being entered into the profile database.

21 For example, in Figure 3 it can be seen that a patient  
22 suffering from a chronic disease who contracts a second disease  
23 could be treated both for the chronic disease and for the second  
24 disease during the disease state (i.e. between onset and  
25 resolution). If all medical provider billing data during the  
26 disease state were entered into the database, then the database  
27 would contain erroneous historical data for that individual's

1 diagnosis. For example, if a patient who suffers from psoriasis  
2 were to be diagnosed with acute appendicitis and received  
3 treatment for psoriasis between the time of onset and resolution  
4 of his acute appendicitis, then the provider billings would  
5 contain both billings for treatment of the psoriasis and the  
6 acute appendicitis. Therefore the invention incorporates methods  
7 for discerning medical provider billings irrelevant to a  
8 particular diagnosis. Further, the disease state could be the  
9 active state of a chronic disease, and resolution could be the  
10 disease returning to its inactive state. A method for handling  
11 this situation is therefore also provided.

12 Other alternatives in the course of a disease further  
13 complicate accurately defining an episode of care. From Figure 4  
14 it can be seen that for any particular diagnosis, the outcome  
15 could be resolution, as described above, return to the chronic  
16 state of a disease, or complication of the disease. For example,  
17 if a patient has undergone an appendectomy, the patient may  
18 contract an infection following the surgical procedure. Because  
19 complications of various types and durations and in varying  
20 frequencies are associated with various diagnoses, a method for  
21 incorporating the complication data into the statistically-  
22 derived practice parameter is intended to be provided in the  
23 invention.

24 Figure 5 depicts the phases of an episode of care, including  
25 the sequence of patient workup, treatment, and eventual  
26 resolution, return to the chronic state, or complication followed  
27 by either resolution or return to the chronic state.



The method for defining an entire episode of care provided in the invention is used to construct a database of profiles based on billing data that has been filtered to eliminate data irrelevant to the diagnosis which would lead to an erroneous profile. Essential to the determination of an EOC are certain qualifying circumstances. These circumstances are managed through the use of four inter-relational qualifying tables, to provide a mechanism for sorting patient history for the occurrence of specific procedures or ICD codes that are requisite for an EOC to be valid.

The steps used in the preferred embodiment to determine an episode of care are shown in figure 12 and as follows.

a.) Data Sort by Index Code

First, 1201, the raw data set which has undergone RAM processing is sorted by index code (i.e. general diagnosis) to find all patient records with occurrence of a particular index code on at least two different dates of service. Second, 1202, qualifying ICD codes (specific diagnosis) associated with the index code in question are found by searching patient history for at least one occurrence of the specific category or index code, to be considered in the criteria of an episode of care. Third, 1203, during this step patient history records are searched for qualifying circumstances such as procedures relating to specific medical conditions which may have been indicated as usually requiring an Evaluation and Management (E/M) service during the course of treatment. For example, an occurrence of a qualifying circumstance such as an E/M service during the patient history is

considered in the criteria of an episode of care. Fourth, 1204, once the data history has been searched for qualifying circumstances, the valid components of these patient records are then checked against the three inter-relational Index Tables to identify qualifying ICD codes associated with the chosen index code. In addition, the patient records are searched for any comorbidity ICD codes that would disqualify the patient record for inclusion in the EOC (such as diabetes with renal failure). Records then are given a staging indicator (i.e. chronic, acute, life-threatening, etc.) associated with the index code to continue in the EOC process in the determination of windows.

Fifth, 1205, a temporary file is created based on combining the authorized and/or disallowed ICD codes that are associated with a given index code in the Index Global Table (listing preventative and aftercare codes) and the Index Detail tables. The temporary file is created using the Index Table Pointers, which determine whether or not the Index Detail Table only should be accessed or whether the Index Global Table is also necessary for drafting the temporary file. Sixth, 1206, for each unique patient record that has been identified as containing the assigned Index code with its associated staging, the entire data set is searched to find the first occurrence of its index code and the date of that record.

#### **b.) Determination of Clear Windows**

Clear window processing defines the onset and resolution points of a diagnosis to establish an episode of care. The actual parameters used in clear window processing may vary in

1 various implementations of the invention. Based on the staging  
2 indicator, a pre-episode window time period and a post-episode  
3 window time period are selected from the table, 1207. Then,  
4 1208, beginning with the first occurrence of an index code in the  
5 patient record, a search backward in time is made until no  
6 services relating to the diagnosis are found. Then a further  
7 search backward in time is made to determine a pre-episode clear  
8 window. If any of the ICD codes, V-codes or complications codes  
9 found during the data sort by index code processing are found  
10 during this search backward in time that fall outside of the pre-  
11 episode window time period, there is no clear window and that  
12 patient record is rejected and not used. Processing begins again  
13 with the sort by index code for a new patient record. If a clear  
14 pre-episode window has been found, the patient record continues  
15 through post-episode window determination.

16 Once a clear pre-episode window has been found, a search is  
17 made for a clear post-episode window, 1209. This comprises two  
18 searches forward in time. The first search is to establish the  
19 date of the procedure code in question. Then a further search  
20 forward in time is made for the clear post-episode window. If  
21 the second search to determine the clear post-episode window  
22 reveals any of the ICD codes, V-codes or complications codes  
23 found during the data sort by index code processing are found  
24 outside of the post-episode window time period (as specified by  
25 the staging indicator), there is no clear window and that patient  
26 record is rejected and not used. Processing would begin again  
27 with the sort by index code for a new patient record. If a clear

1 window has been found the patient record can be analyzed for a  
2 valid episode of care.

3 c.) Valid Episode of Care

4 The patient record is then checked to determine if the index  
5 code in question appears on at least two dates of service. If  
6 the index code appears on only one date, the record is rejected.  
7 The qualifying tables are then checked to determine if the record  
8 meets the minimum criteria for procedure codes (such as surgical  
9 services) that are expected to be found within an episode of care  
10 for a given index code. If the minimum criteria are not found in  
11 an episode of care, the patient record will be rejected and it  
12 will not be considered in the profile summary. Processing would  
13 then resume with a new patient record and data sort by index  
14 code. Once an EOC has been determined for a set of claims  
15 history meeting the criteria for an Index code, the information  
16 can be sorted by different combinations of treatment patterns  
17 that are likely to arise for a given medical condition, 1210.  
18 There are eight basic profile classes which outline the common  
19 combinations of treatment patterns to statistically analyze and  
20 store. These Profile Classes are:

- 21 0. Common Profile (diagnostic and E/M services common to  
22 all of the above).
- 23 1. Surgery/Medicine/Radiation Profile
- 24 2. Medicine/Radiation Profile
- 25 3. Surgery/Radiation Profile
- 26 4. Surgery/Medicine Profile
- 27 5. Radiation Profile

1           6.   Medicine Profile

2           7.   Surgery Profile

3           8.   Summary Profile (summary of 0-7 above)

4           If the patient record contains the minimum criteria for an  
5   EOC then processing continues with population of the procedure  
6   and category tables.

7           d.)   Populating the Procedure and Category Parameter Tables

8           Patient records that have not been rejected by this point in  
9   the process will be added to the procedure and category tables,  
10   1211. Data from all of the episodes of care for each index code  
11   are inserted into the parameter tables to create the summary  
12   statistical profiles. In the preferred embodiment these tables  
13   are accessed by index code and populated with data from all the  
14   episodes of care for each index code to create and provide  
15   summary statistics. The information generated is driven by the  
16   index code and is sorted chronologically and by category of  
17   procedures. The procedure description table and category table  
18   are also accessed to determine a description of the procedure  
19   codes and the service category in which they fall.

20          The final step of the EOC process is the generation of  
21   output reports, 1212. The output report of this step can be  
22   either a on-line look-up report or a hard copy report. Reports  
23   are further described below.

24          The reader is directed to the Microfiche Appendix containing  
25   the source code for EOC processing and to Figure 9 for  
26   supplementary information.

At this point, parameter tables have been created which may be accessed for various purposes. A description of these was listed above.

## B. Use of the Database

### 1. Look-up Function

In the preferred embodiment of the invention, a look-up function is provided so that various information available in the database may be accessed. In general, a specific diagnosis may be reviewed in each of the tables of the database based on ICD code. In various embodiments of the invention, other look-up functions may be provided based on nearly any category of information contained in the database. In the preferred embodiment of the invention display of profiles is performed as part of the look-up function. Information in the procedure and category parameter tables are displayed by index code sorted chronologically to show a profile.

The specific steps of the preferred embodiment of the Look-Up function of the invention are shown in figure 13 and described as follows.

The first step, 1301, is to review the reference tables for a given Index ICD code. Once a specific diagnosis is chosen for review the process moves to step two. In step two, 1302, the ICD description table is accessed to verify that the ICD-9 code is valid, complete and to provide a description of the diagnosis. It will also indicate a risk adjustment factor assigned to the diagnosis.

1 In step three, the Index tables are accessed, 1303. Next,  
2 step four, 1304, is to determine whether or not the chosen ICD  
3 code is an Index code. If it is found as an Index code, any  
4 additional ICD codes associated with the selected Index code  
5 will be accessed, 1305. If a chosen diagnosis is not listed as  
6 an index code, a prompt, 1306, will allow a search for the  
7 selected ICD code to list which index code(s) it may be  
8 associated with and its indicator, 1307. A word search  
9 capability, 1308, is included in the look-up function applicable  
10 to the Index code display. A word or words of a diagnosis is  
11 entered and a search of possible ICD codes choices would be  
12 listed.

13 The next step, 1309, is to access the Parameter Tables to  
14 display selected profiles. The information provided is driven by  
15 the index code and is sorted chronologically, by profile class  
16 and by category of procedures. The user is then given the  
17 opportunity to choose whether the profiles to be accessed are  
18 from the reference tables, client developed profiles, or both,  
19 1310. Next the Procedure Description Table, 1311, and the  
20 Category Table, 1312, are accessed to ascertain description of  
21 procedure codes and categories under which they fall.

22 The last step of the Look-Up function is the output of  
23 report product, 1313. This report may either be on-line look-up  
24 process or in the hard copy report format.

25 The preferred embodiment of the invention also performs  
26 subset profile look-up. This permits analysis of profiles based

1 on selected subsets of data such as age, gender, region and  
2 provider specialty.

3 The process for the subset of profiles look-up includes all  
4 of the steps necessary for the general profiles look-up and  
5 includes the following additional steps shown in figure 14 and  
6 described below.

7 The Age/Gender Table is accessed to ascertain the standard  
8 age ranges and/or gender selection for a given profile, 1402.  
9 This information is stored by index code with an adjustment  
10 factor to be multiplied against the occurrence count of each  
11 procedure stored in the parameter table. For example, an  
12 adjustment factor of 0.6 associated with an age range of 0 to 17  
13 would be calculated against an occurrence count of 10 for CPT  
14 code 71021 for Index code 493XX giving an age adjusted occurrence  
15 of 6 for that age range.

16 The Region Statistic Table, 1403, is accessed and used in a  
17 similar manner as the Age/Gender Table. This table has  
18 adjustment factors based on ten regions throughout the United  
19 States.

20 The Zip/Region Table, 1404, is accessed to identify what  
21 region a particular geographic zip code falls within.

22 The CPT Statistic Table, 1405, is accessed and used in a  
23 similar manner as the Age/Gender table. This table has  
24 adjustment factors based on different medical specialty  
25 groupings.

26 The Specialty table, 1406, is accessed to ascertain what  
27 particular specialty groupings are suggested.



1       The subset parameter Look-Up function also includes the  
2       capability of producing output reports, 1407. These reports can  
3       be on-line look-up process reports or hard-copy report format  
4       reports.

## 5       2. Comparison Processing

6       In the preferred embodiment of the invention, it is possible  
7       to compare profiles developed from a data set against profiles  
8       developed from a reference data set. Subsets of profiles may be  
9       compared as well. Profiles may be compared for any index code  
10      and profile reports may be output. It is also possible to  
11      identify those medical providers (whether individuals or  
12      institutions) who provide treatment that does not fall within the  
13      statistically established treatment patterns or profiles.

14      Further, various treatment patterns for a particular diagnosis  
15      can be compared by treatment cost and patient outcome to  
16      determine the most effective treatment approach. Based on  
17      historical treatment patterns and a fee schedule, an accurate  
18      model of the cost of a specific medical episode can be created.

19      The specific process of Comparison Processing is shown in  
20      figure 15 and described as follows. The first step, 1501, is the  
21      comparison of information developed from the data history search  
22      process with reference information stored in the Parameter  
23      Tables. The next step, 1502, is to test the services from the  
24      history processing to see if it falls within the defined  
25      statistical criteria in the Parameter Tables. If it does an  
26      indicator is given to this effect, 1504. If the services fall  
27      outside the statistical criteria of the reference Parameters

Table, a variance alert describing the difference will be given, 1503. The process may be repeated for each index code and its profile developed in the history process, 1505. The final step is to produce output reports, 1506. These reports are either on-line look-up process reports or hard-copy report format reports.

### 3. Reporting

Reporting of various information contained in the database is provided in the preferred embodiment. Six different types of reports or displays are provided in the preferred embodiment, these are: Provider Practice Profile Report, Profile Comparison Reports, Resident Parameters Display, Local Parameters Display, Parameter Comparison Report and Chronological Forecast. Each of these reports or displays is described as follows.

The Provider Practice Profile Report is a set of reports which provide a tally or summary of total CPT and/or ICD code utilization by a provider or group of providers during a specified time interval and allows comparison against provided reference data or client generated reference data.

The select criteria for running the tally can be any one of the following:

- single physician, department, specialty or clinic by CPT and/or ICD
- multiple physicians, departments, specialties, or clinics by specialty, region, CPT and/or ICD
- period of time being analyzed

Included in the report is the following:

- criteria for select

- claims analyzed
- average lines per bill
- invalid CPTs and percent of total for study
- invalid ICDs and percent of total for study
- incomplete ICDs and percent of total for study
- patients in age categories
- patients by gender
- missing ICDs and percent of total for study

The report includes numerous (up to about 22 in the preferred embodiment) separate procedure (such as CPT) categories which are headers for each page. Each CPT utilized within that category will be reported by:

- frequency and percent of total
- dollar impact and percent of total for single or multiple fee schedules and/or allowable reimbursement schedules
- grand total if more than a single physician report

The report includes a tally by ICD. Each ICD utilized is reported on by:

- frequency and percent of total
- dollar impact and percent of total for single or multiple fee schedule and/or allowable reimbursement schedules (dollar impact based on each line item CPT correlated to the ICD)

If a report includes region and/or specialty, there are numerous tallies for procedure categories and/or ICD.

The Profile Comparison Reports give the client a comparison of a health care provider's (or group of providers') utilization

1 of CPT and/or ICD-9 codes in a specific episode of care against a  
2 reference set of utilization profiles. This includes number,  
3 frequency and chronological order of services along with other  
4 statistical information (eg, range, mode, confidence interval,  
5 etc . . ).

6 The comparison can be against one of the following:

- 7 - national norms resident in the tables
- 8 - regional norms resident in the tables
- 9 - client established norms developed by use of the tally  
10 report, outlined above
- 11 - other

12 Selection criteria include the following:

- 13 - single physician, department, clinic or specialty by CPT  
14 and/or ICD to be compared against national, regional,  
15 specialty, and/or client established norms
- 16 - multiple physicians, departments, clinics, or specialties  
17 by CPT and/or ICD by specialty and/or region, to be  
18 compared against national, region, specialty, and/or  
19 client established norms
- 20 - set period of time being analyzed

21 General information included in the report includes:

- 22 - criteria for select (ie, national, regional, specialty,  
23 and/or client established)
- 24 - claims analyzed
- 25 - average lines per bill
- 26 - invalid CPTs and percent of total for study and comparison
- 27 - invalid ICDs and percent of total for study and comparison

- incomplete ICDs and percent of total for study and comparison
- patients in age categories and comparison
- patients by gender and comparison
- missing ICDs and percent of total for study and comparison

The report includes numerous separate CPT categories which are headers for each page. Each CPT utilized within that category will be reported by:

- frequency and percent of total
- dollar impact and percent of total for single or multiple fee schedules and/or allowable reimbursement schedules
- grand total if more than a single physician report

The report includes a tally by ICD. Each ICD utilized is reported on by:

- frequency and percent of total
- dollar impact and percent of total for single or multiple fee schedule and/or allowable reimbursement schedules (dollar impact based on each line item CPT correlated to the ICD)

If a report includes region and/or specialty, there are numerous tallies for CPT categories and/or ICD.

The Resident Parameters Display provides the client a look-up mode for information stored in the Practice Parameter Tables or client generated parameter tables. This look-up should be on the computer screen or as a print out.

The selection criteria is based on the key elements of the Practice Parameter tables. For Example:

- 1       - Index code for associated CPT codes and/or any other the
- 2               following:
- 3       - index code only
- 4       - index code and indicators (ie, related, complicating,
- 5               rule/outs, symptoms, etc)
- 6       - specialty
- 7       - region
- 8       - age
- 9       - gender
- 10       - standard length of Episode of Care
- 11       - based on profile (tally)
- 12       - based on parameter (timeline)
- 13       - regional variables
- 14       - other misc. look-ups
- 15       - geozips incorporated in a region
- 16       - CPT for follow up days and/or lifetime occurrence
- 17       - specialty and associated CPT codes
- 18       - ICD and Risk Factor

19       The Local Parameters Display provides the same information  
20 as described in the Display of Resident Parameters listed above.

21       The Parameter Comparison Reports are a set of reports which  
22 give the client a comparison of a physician (or group of  
23 physicians) utilization of CPT and/or ICD against an existing set  
24 of utilization norms over a timeline and in chronological order.

25       The comparison can be against one of the following:

- 26       - national norms resident in the tables
- 27       - regional norms resident in the tables

- client established norms developed by use of the tally report, outlined above
  - other
- Selection criteria include the following:
- single physician, department, clinic or specialty by CPT and/or ICD to be compared against national, regional, specialty, and/or client established norms
  - multiple physicians, departments, clinics, or specialties by CPT and/or ICD by specialty and/or region, to be compared against national, region, specialty, and/or client established norms
  - set period of time being analyzed
- General information included in the report includes:
- criteria for select (ie, national, regional, specialty, and/or client established)
  - claims analyzed
  - average lines per bill
  - invalid claims due to incomplete Episode of Care
  - invalid CPTs and percent of total for study and comparison
  - invalid ICDs and percent of total for study and comparison
  - incomplete ICDs and percent of total for study and comparison
  - patients in age categories and comparison
  - patients by gender and comparison
  - missing ICDs and percent of total for study and comparison

1 The report includes numerous separate procedure categories  
2 which are headers for each page. Each procedure category  
3 utilized within that category will be reported by:

- 4 - frequency and percent of total
- 5 - dollar impact and percent of total for single or multiple
- 6 fee schedules and/or allowable reimbursement schedules
- 7 - grand total if more than a single physician report

8 The Chronological Forecast provides statistical trend  
9 analysis and tracking of the utilization of billing codes  
10 representative of services performed by a physician for a given  
11 diagnosis over a set period of time and stored in chronological  
12 order. It will provide a summation of billed codes  
13 representative of services and diagnoses utilized by an entity  
14 over a period of time.

#### 15 C. System Requirements

16 The method and system of this invention may be implemented  
17 in conjunction with a general purpose or a special purpose  
18 computer system. The computer system used will typically have a  
19 central processing unit, dynamic memory, static memory, mass  
20 storage, a command input mechanism (such as a keyboard), a  
21 display mechanism (such as a monitor), and an output device (such  
22 as a printer). Variations of such a computer system could be  
23 used as well. The computer system could be a personal computer,  
24 a minicomputer, a mainframe or otherwise. The computer system  
25 will typically run an operating system and a program capable of  
26 performing the method of the invention. The database will  
27 typically be stored on mass storage (such as a hard disk, CD-ROM,



1 worm drive or otherwise). The method of the invention may be  
2 implemented in a variety of programming languages such as COBOL,  
3 RPG, C, FORTRAN, PASCAL or any other suitable programming  
4 language. The computer system may be part of a local area  
5 network and/or part of a wide area network.

6 It is to be understood that the above-described embodiments  
7 are merely illustrative of numerous and varied other embodiments  
8 which may constitute applications of the principles of the  
9 invention. Such other embodiments may be readily devised by  
10 those skilled in the art without departing from the spirit or  
11 scope of this invention and it is our intent that they be deemed  
12 within the scope of our invention.

## Claims

We claim:

1. In a general purpose computer system comprising:

a central processing unit,

dynamic memory,

static memory,

a display device,

an input device,

an output device

a mass storage device which contains

a number of historical medical provider  
patient billing records identifiable as  
patient records,

a grouping of diagnosis codes,

a grouping of qualifying circumstance  
codes,

a grouping of staging indicators,

a grouping of preventive codes,

a grouping of complication codes,

a method for generating a medical provider profile comprising the  
steps of:

(a) selecting a diagnosis code,

(b) reading a plurality of patient records from  
the mass storage device into the dynamic memory, each of  
said patient records having said selected diagnosis code and

1 all of said patient records read corresponding to a single  
2 patient,

3 (c) comparing each of said read patient records  
4 with each qualifying circumstance code in the grouping of  
5 qualifying circumstance codes,

6 (d) re-sorting each of said patient records  
7 having a qualifying circumstance,

8 (e) reading a staging indicator corresponding to  
9 said selected diagnosis code into dynamic memory,

10 (f) creating a grouping of said selected  
11 diagnosis code with each code in the grouping of related  
12 diagnoses codes which correspond to said selected diagnosis  
13 code thereby creating a grouping of related codes,

14 (g) searching said plurality of read patient  
15 records for the record containing the earliest date on which  
16 said selected diagnosis code occurs and noting said date as  
17 a first occurrence date,

18 (h) for each read patient record corresponding to  
19 a code in said grouping of related codes, rejecting said  
20 read patient record if a comparison of each of said read  
21 patient records with said staging indicator and said first  
22 occurrence date shows that for any read patient record, the  
23 date of a read patient record predates said first occurrence  
24 date by a period of time that exceeds said staging  
25 indicator,

26 (i) for each read patient record corresponding to  
27 a code in said grouping of related codes, rejecting said

1 read patient record if a comparison of each of said read  
2 patient record with said staging indicator and said first  
3 occurrence date shows that for any read patient record, the  
4 date of a read patient record postdates said first  
5 occurrence date by a period of time that exceeds said  
6 staging indicator,

7 (j) for each read patient record not rejected in  
8 steps (a) through (i) above, rejecting said record if said  
9 selected diagnosis code does not appear on at least two  
10 separate dates on said record,

11 (k) for each read patient record not rejected in  
12 steps (a) through (j) above, writing said record into a  
13 parameter table to create a profile for said selected  
14 diagnosis.

15  
16 2. In a general purpose computer system comprising:

17 a central processing unit,

18 dynamic memory,

19 static memory,

20 a display device,

21 an input device,

22 an output device

23 a mass storage device which contains

24 a grouping of medical provider profiles,

25 a method for utilizing a medical provider profile comprising the  
26 steps of:

1 (a) selecting a medical provider profile having a  
2 plurality of parameters,

3 (b) receiving a medical claim that includes a  
4 diagnosis and

5 (c) comparing said medical claim diagnosis to  
6 said medical provider profile to determine whether said  
7 medical claims falls within the parameters of said profile.  
8

9 3. A system for establishing medical provider profiles, the  
10 system comprising:

11 (a) means for receiving a quantity of historical  
12 medical provider patient billing records identifiable as  
13 patient records,

14 (b) a grouping of diagnosis codes,

15 (c) a grouping of qualifying circumstances,

16 (d) a grouping of staging indicators,

17 (e) a grouping of preventive codes,

18 (f) a grouping of complication codes,

19 (g) means for selecting a diagnosis code,

20 (h) means for organizing a grouping of patient  
21 records, each of said organized patient records having a  
22 selected diagnosis code and all of said organized patient  
23 records corresponding to a single patient,

24 (i) means for comparing each of said organized  
25 patient records with each qualifying circumstance,

26 (j) means for rejecting each of said patient  
27 records having a qualifying circumstance,

(k) means for reading a staging indicator corresponding to said selected diagnosis code into dynamic memory,

(l) means for creating a grouping of said selected diagnosis code with each code in a grouping of qualifying circumstance codes which corresponds to said selected diagnosis code thereby creating a grouping of related codes,

(m) means for searching said plurality of read patient records for the record containing the earliest date on which said selected diagnosis code occurs and noting said date as a first occurrence date,

(n) for each read patient record corresponding to a code in said grouping of related codes, means for rejecting said read patient record if a comparison of each of said read patient records with said staging indicator and said first occurrence date shows that for any read patient record, the date of a read patient record predates said first occurrence date by a period of time that exceeds said staging indicator,

(o) for each read patient record corresponding to a code in said grouping of related codes, means for rejecting said read patient record if a comparison of each of said read patient record with said staging indicator and said first occurrence date shows that for any read patient record, the date of a read patient record postdates said

1 first occurrence date by a period of time that exceeds said  
2 staging indicator,

3 (p) for each read patient record not rejected in  
4 steps (a) through (o) above, means for rejecting said record  
5 if said selected diagnosis code does not appear on at least  
6 two separate dates on said record,

7 (q) for each read patient record not rejected in  
8 steps (a) through (p) above, means for writing said record  
9 into a parameter table to create a profile for said selected  
10 diagnosis.

11  
12 4. In a general purpose computer system comprising:

13 a central processing unit,

14 dynamic memory, and

15 a mass storage device,

16 a method for establishing a medical provider profile comprising  
17 the steps of:

18 (a) receiving a number of medical provider  
19 billing records,

20 (b) selecting a general diagnosis code,

21 (c) selecting a patient record that contains said  
22 diagnosis code from said medical provider billing records,

23 (d) comparing said patient record with a  
24 qualifying circumstance table and rejecting said patient  
25 record if it contains a qualifying circumstance code,

(e) selecting from a table containing specific diagnosis codes all specific diagnosis codes related to said general diagnosis code,

(f) selecting from a table containing preventive codes all preventive codes related to said general diagnosis code,

(g) selecting from a table containing aftermath codes all aftermath codes related to said general diagnosis code,

(h) grouping said general diagnosis code, said selected specific diagnosis codes, said selected preventive diagnosis codes, and said selected aftermath codes into a group of related codes,

(i) assigning said patient record with a staging indicator associated with said general diagnosis code,

(j) determining a first occurrence of said general diagnosis code in said patient record,

(k) rejecting said patient record if a comparison of the date of each occurrence of a code in said group of related codes with said first occurrence date shows that an occurrence of a code in said group of related codes has a date that predates the first occurrence date by more than a period of time indicated by said staging indicator,

(l) rejecting said patient record if a comparison of the date of each occurrence of a code in said group of related codes with said first occurrence date shows that an occurrence of a code in said group of related codes has a



1 date that postdates the first occurrence date by more than a  
2 period of time indicated by said staging indicator,

3 (m) rejecting said patient record if said  
4 diagnosis code appears in said patient record on no more  
5 than a single date,

6 (n) if said patient record has not been rejected,  
7 entering it into a parameter database.

8  
9 5. A method for analyzing a healthcare provider billing  
10 patterns comprising the steps of:

11 (a) obtaining a base data set of medical provider billing  
12 information,

13 (b) verifying base data contained in said base data set,  
14 said verifying step including identifying the existence of errors  
15 in said base data,

16 (c) correcting errors identified during said verifying  
17 step,

18 (d) obtaining a healthcare provider billing data set,

19 (e) comparing said healthcare provider billing data with  
20 said base data, and

21 (f) generating a report which describes a relationship  
22 between said healthcare provider billing data and said base data.

23  
24 6. A method as recited in claim 5, wherein said step of  
25 obtaining a base data set of medical provider billing information  
26 further comprises:

27 (i) obtaining an existing data set comprising:

1 national profiles and  
2 regional profiles,

3 (ii) building a base data set comprising patient records  
4 comprising:

5 line items,  
6 identifying codes for reporting medical  
7 services,

8 Index codes,  
9 Dates of Service, and  
10 Service Name,

11 (iii) determining a patient record from said base data set  
12 of patient records for an episode of care extraction process, and

13 (iv) manipulating said patient record to extrapolate  
14 desired information.  
15

16 7. A method as recited in claim 5 wherein said base data  
17 contained in said base data set comprises:

18 (i) a claims history that includes a plurality of line  
19 items,

20 (ii) a plurality of description tables of data that  
21 include

22 (1) a Identifying code for reporting a medical  
23 service description table,

24 (2) a description table, and

25 (3) an disease classification description table,

26 (iii) checking said line items against said  
27 Identifying code for reporting a medical service description table,

1 (iv) checking said line items against said  
2 description table,

3 (v) checking said line items against said disease  
4 classification description table,

5 (vi) counting invalid line items,

6 (vii) checking said line items against date of  
7 service, said checking step comprising:

8 (1) expanding into separate line items any said  
9 line items which contain "date of service from" and a "data of  
10 service to" where the said two dates are not the same,

11 (2) dating said services with a unique date of  
12 service beginning with said "date of service from" for first said  
13 line item and ending with said "date of service to" for last said  
14 line item, and

15 (viii) converting Identifying code for reporting a  
16 medical service code formats to standard identifying code for  
17 reporting a medical service code format.

18  
19 8. A method as recited in claim 5, wherein said step of  
20 correcting errors identified further comprises:

21 (a) detecting a duplicate line item among said line  
22 items,

23 (b) editing said claims history line items,

24 (c) detecting a inappropriately billed service among said  
25 services, and

26 (d) editing said inappropriately billed service.  
27

1           9. A method as recited in claim 5, wherein said step of  
2 comparing said healthcare provider billing data with said base  
3 data further comprises:

4           (a) performing a data history search producing an  
5 information set,

6           (b) accessing a plurality of parameter tables, said  
7 parameter table comprising

8               (i) index codes, and

9               (ii) statistical criteria,

10          (c) comparing said information set against said index  
11 codes,

12          (d) checking if said information set falls within a  
13 defined statistical criteria,

14          (e) setting an indication if said information set falls  
15 within said defined statistical criteria, and

16          (f) providing a variance alert describing differences  
17 between said information set and said defined statistical  
18 criteria.  
19

20          10. A method as recited in claim 5, wherein said step of  
21 generating a report which describes a relationship between said  
22 healthcare provider billing data and said base data further  
23 comprises:

24          (a) producing a comparison report comprising:

25               (i) a plurality of healthcare provider's utilization of  
26 Identifying code for reporting a medical service codes,

27               (ii) a reference set of utilization profiles,

(iii) a plurality of healthcare provider's utilization of disease classification codes,

(iv) a first comparison summary of said healthcare provider's utilization of Identifying code for reporting a medical service codes against said reference set of utilization profiles, said first comparison summary comprising

(a) the number of said services,

(b) the frequency of said services,

(c) the chronological order of said services, and

(d) statistical information on said services,

comprising:

(1) the range,

(2) the mode, and

(3) the confidence interval,

(v) a second comparison summary of said healthcare provider's utilization of disease classification codes against said reference set of utilization profiles, said second comparison summary comprising

(a) the number of said services,

(b) the frequency of said services,

(c) the chronological order of said services, and

(d) statistical information on said services,

comprising:

(1) the range,

(2) the mode, and

(3) the confidence interval,

(b) producing a provider practice profile report comprising:

1 (i) a summary of total Identifying code for reporting a  
2 medical service utilization by said healthcare provider during a  
3 specified time interval to provide a comparison against said  
4 reference data, and

5 (ii) a summary of total disease classification code  
6 utilization by said healthcare provider during a specified time  
7 interval to provide a comparison against said reference data.  
8

9 11. A method for analyzing a healthcare provider billing  
10 patterns comprising the steps of:

11 (a) obtaining a base data set of medical provider billing  
12 information,

13 (b) verifying base data contained in said base data set,  
14 said verifying step including identifying errors in said base  
15 data,

16 (c) correcting errors identified during said verifying  
17 step,

18 (d) establishing an episode of care for a particular  
19 medical event,

20 (e) obtaining a healthcare provider billing data set,

21 (f) comparing said healthcare provider billing data with  
22 said base data,

23 (g) reviewing a patient medical history record contained  
24 within said healthcare provider billing data set for the presence  
25 of a specific medical procedure, and

26 (h) generating a report which describes a relationship  
27 between said healthcare provider billing data and said base data.

12. A method as recited in claim 11,  
wherein said step of obtaining a base data set of medical  
provider billing information further comprises:  
(i) obtaining a commercially available data set comprising:  
national profiles, and  
regional profiles,  
(ii) building base data set comprising patient records  
comprising:  
line items,  
Identifying code for reporting a medical  
service codes,  
Index codes,  
Dates of Service, and  
Service Name,  
(iii) determining a patient record from said base data set  
of patient records for an episode of care extraction process, and  
(iv) manipulating said patient record to extrapolate  
pertinent information to conform with procedure logic.

13. A method as recited in claim 11  
wherein said step of verifying base data contained in said  
base data set, further comprises:  
(i) obtaining a claims history, said claims history  
comprising a plurality of line items,  
(ii) accessing a plurality of description tables of data,  
aid description tables comprising:

(1) a table of Identifying codes for reporting a medical service description,

(2) a description table, and

(3) a disease classification description table,

(iii) checking said line items against said Identifying code for reporting a medical service description table to determine whether said line item is valid,

(iv) checking said line items against said description table to determine whether said line item is valid,

(v) checking said line items against said disease classification description table to determine whether said line item is valid,

(vi) counting invalid line items,

(vii) checking said line items against date of service, said date of service checking comprising:

(1) expanding into separate line items any said line items which contain "date of service from" and a "data of service to" where the said two dates are not the same,

(2) dating said services with a unique date of service beginning with said "date of service from" for first said line item and ending with said "date of service to" for last said line item, and

(viii) converting Identifying code for reporting a medical service code formats to standard Identifying code for reporting a medical service code format.



1           14. A method as recited in claim 11, wherein said step of  
2     correcting identified errors further comprises:

- 3           (a) detecting a duplicate line item among said line  
4     items,  
5           (b) editing said claims history line items,  
6           (c) detecting a inappropriately billed service among said  
7     services, and  
8           (d) editing said inappropriately billed services.

9  
10           15. A method as recited in claim 11, wherein said step of  
11     comparing said healthcare provider billing data with said base  
12     data further comprises:

- 13           (a) performing a data history search to produce an  
14     information set,  
15           (b) accessing a plurality of parameter tables comprising  
16               (i) index codes, and  
17               (ii) statistical criteria,  
18           (c) comparing said information set against said index  
19     codes,  
20           (d) checking if said information set falls within a  
21     defined statistical criteria,  
22           (e) setting an indication if said information set falls  
23     within said defined statistical criteria, and  
24           (f) providing a variance alert describing differences  
25     between said information set and said defined statistical  
26     criteria.

1           16. A method as recited in claim 11, wherein said step of  
2 generating a report which describes a relationship between said  
3 healthcare provider billing data and said base data further  
4 comprises:

5           (a) producing a comparison report comprising:

6               (i) a plurality of healthcare provider's utilization of  
7 Identifying code for reporting a medical service codes,

8               (ii) a reference set of utilization profiles,

9               (iii) a plurality of healthcare provider's utilization  
10 of disease classification codes,

11               (iv) a comparison of said healthcare provider's  
12 utilization of Identifying code for reporting a medical service  
13 codes against said reference set of utilization profiles,  
14 comprising:

15                   (A) number of said services,

16                   (B) frequency of said services,

17                   (C) chronological order of said services, and

18                   (D) statistical information on said services,

19 comprising:

20                       (1) range,

21                       (2) mode, and

22                       (3) confidence interval,

23           (v) a comparison of said healthcare provider's  
24 utilization of disease classification codes against said  
25 reference set of utilization profiles, comprising:

26                   (A) number of said services,

27                   (B) frequency of said services,

(C) chronological order of said services, and  
(D) statistical information on said services,  
comprising:  
(1) range,  
(2) mode, and  
(3) confidence interval,  
(b) producing a provider practice profile report comprising:  
(i) a summary of total Identifying code for reporting a  
medical service utilization by said healthcare provider during a  
specified time interval to provide a comparison against said  
reference data, and  
(ii) a summary of total disease classification code  
utilization by said healthcare provider during a specified time  
interval to provide a comparison against said reference data.  
17. A method as recited in claim 11, wherein said step of  
establishing an episode of care for a particular medical event  
further comprises:  
(a) identifying a plurality of medical conditions that  
require a specific category procedure during a course of  
treatment,  
(b) identifying a plurality of medical conditions that have  
a qualifying circumstance,  
(c) identifying a plurality of interrelational index  
tables,  
(d) designating a particular index code,

(e) identifying a patient record with said index code on at least two said dates of service,

(f) rejecting patient records with less than two occurrences of said particular index code,

(g) searching said patient record for at least one occurrence of the said specific category procedure in said patient record,

(h) searching said patient record for at least one occurrence of an qualifying circumstance,

(i) checking said patient records against said Index Tables, to identify disease classification codes associated with an index code,

(j) creating a temporary file based on combining said disease classification codes that are associated with a given said index code,

(k) checking a patient record identified as containing a selected index code to find the first occurrence of said index code,

(l) searching through said patient record backward in time starting with said first occurrence of said index code for a clear window,

(m) searching through said patient record forward in time starting with said first occurrence of said index code for a clear window,

(n) rejecting said patient record if no clear window is found,

(  
1 (o) establishing an Episode of Care if both said backward  
2 clear window and said forward clear windows are found,

3 (p) accessing a plurality of medical treatment patterns,

4 (q) sorting said base data set information from said  
5 patient records by plurality of treatment patterns,

6 (r) accessing a plurality of parameter tables,

7 (s) populating said parameter tables with said base data  
8 from all said episodes of care for each said index code to  
9 provide summary statistics, and

10 (t) sorting said parameter tables information  
11 chronologically, category and by said profile classes.

12  
13 18. A method as recited in claim 11, wherein said step of  
14 reviewing a patient medical history record further comprises:

15 (a) accessing a plurality of parameter tables,

16 (b) choosing a disease classification description for  
17 review,

18 (c) accessing a disease classification description table,

19 (d) accessing said disease classification description table  
20 to verify said diagnosis code is valid,

21 (e) accessing said disease classification description table  
22 to verify said diagnosis code is an Index code,

23 (f) prompting for a search for said selected disease  
24 classification code to list what index codes it may be associated  
25 with, if said chosen diagnosis is not listed as an Index code,

26 (g) conducting a word search for the said diagnosis to the  
27 said disease classification codes in said Index code,

(h) accessing said parameter tables to display selected profiles,  
(i) choosing said profiles from one of said data sets, and  
(j) accessing procedure description table and category table to ascertain procedure description codes.

19. A method for analyzing a healthcare provider's billing patterns comprising the steps of:

(a) obtaining a base data set of medical provider billing information,

(b) verifying base data contained in said base data set, said verifying step including identifying errors in said base data,

(c) correcting errors identified during said verifying step,

(d) establishing an episode of care for a particular medical event,

(e) screening said base data set for medical records within an episode of care,

(f) obtaining a healthcare provider billing data set,

(g) comparing said healthcare provider billing data with said base data,

(h) reviewing a patient medical history record contained within said healthcare provider billing data set for the presence of a specific medical procedure, and

(i) generating a report which describes a relationship between said healthcare provider billing data and said base data.

1           20. A method as recited in claim 19,  
2           wherein said step of obtaining a base data set of medical  
3 provider billing information further comprises:

4                   (i) obtaining a commercially available data set  
5 comprising:

6                               national profiles, and  
7                               regional profiles,

8                   (ii) building base data set comprising patient  
9 records comprising:

10                              line items,  
11                              Identifying code for reporting a medical  
12 service codes,

13                              Index codes,  
14                              Dates of Service, and  
15                              Service Name,

16                   (iii) determining a patient record from said base  
17 data set of patient records for an episode of care extraction  
18 process, and

19                   (iv) manipulating said patient record to  
20 extrapolate pertinent information to conform with procedure  
21 logic.

22  
23           21. A method as recited in claim 19  
24           wherein said step of verifying base data contained in said  
25 base data set, further comprises:

26                   (i) obtaining a claims history, said claims history  
27 comprising a plurality of line items,

(ii) accessing a plurality of description tables of data, said description tables comprising:

(1) a Identifying code for reporting a medical service description table,

(2) a procedure description table, and

(3) an disease classification description table,

(iii) checking said line items against said Identifying code for reporting a medical service description table to determine whether said line item is valid,

(iv) checking said line items against said procedure description table to determine whether said line item is valid,

(v) checking said line items against said disease classification description table to determine whether said line item is valid,

(vi) counting invalid line items,

(vii) checking said line items against date of service, comprising:

(1) expanding into separate line items any said line items which contain "date of service from" and a "data of service to" where the said two dates are not the same,

(2) dating said services with a unique date of service beginning with said "date of service from" for first said line item and ending with said "date of service to" for last said line item, and

(viii) converting Identifying code for reporting a medical service code formats to standard Identifying code for reporting a medical service code format.



22. A method as recited in claim 19, wherein said step of correcting errors identified further comprises:

(a) detecting any possible duplicate line items among said line items,

(b) editing said claims history line items,

(c) detecting any possible inappropriately billed services among said services, and

(d) editing said inappropriately billed services.

23. A method as recited in claim 19, wherein said step of comparing said healthcare provider billing data with said base data further comprises:

(a) performing a data history search to produce an information set,

(b) accessing a plurality of parameter tables comprising

(i) index codes, and

(ii) statistical criteria,

(c) comparing said information set against said index codes,

(d) checking if said information set falls within a defined statistical criteria,

(e) setting an indicator if said information set falls within said defined statistical criteria, and

(f) providing a variance alert describing differences between said information set and said defined statistical criteria.

1           24. A method as recited in claim 19, wherein said step of  
2 generating a report which describes a relationship between said  
3 healthcare provider billing data and said base data further  
4 comprises:

5           (a) generating a comparison report comprising:

6               (i) a plurality of healthcare provider's utilization of  
7 Identifying code for reporting a medical service codes,

8               (ii) a reference set of utilization profiles,

9               (iii) a plurality of healthcare provider's utilization  
10 of disease classification codes,

11               (iv) a comparison of said healthcare provider's  
12 utilization of Identifying code for reporting a medical service  
13 codes against said reference set of utilization profiles,  
14 comprising

15                   (A) number of said services,

16                   (B) frequency of said services,

17                   (C) chronological order of said services, and

18                   (D) statistical information on said services,

19 comprising:

20                       (1) range,

21                       (2) mode, and

22                       (3) confidence interval,

23           (v) a comparison of said healthcare provider's  
24 utilization of disease classification codes against said  
25 reference set of utilization profiles, comprising

26                   (A) number of said services,

27                   (B) frequency of said services,

(C) chronological order of said services, and  
(D) statistical information on said services,  
comprising:

- (1) range,
- (2) mode, and
- (3) confidence interval,

(b) generating a provider practice profile report  
comprising:

(i) a summary of total Identifying code for reporting a  
medical service utilization by said healthcare provider during a  
specified time interval to provide a comparison against said  
reference data, and

(ii) a summary of total disease classification code  
utilization by said healthcare provider during a specified time  
interval to provide a comparison against said reference data.

25. A method as recited in claim 19, wherein said step of  
establishing an episode of care for a particular medical event  
further comprises:

(a) determining a plurality of medical conditions that  
require a specific category procedure during the course of  
treatment,

(b) determining a plurality of medical conditions that have  
a Qualifying Circumstance,

(c) accessing a plurality of interrelational index tables,

(d) designating a particular index code,

1 (e) identifying a patient record with a particular index  
2 code on at least two said dates of service,  
3 (f) rejecting patient records with less than two  
4 occurrences of the particular index code,  
5 (g) searching said patient record for at least one  
6 occurrence of the a specific category procedure in said patient  
7 record,  
8 (h) searching said patient record for at least one  
9 occurrence of a Qualifying Circumstance,  
10 (i) checking said patient record against said Index Tables,  
11 to identify disease classification codes associated with the  
12 chosen said index code,  
13 (j) creating a temporary file based on combining said  
14 disease classification codes that are associated with a given  
15 said index code,  
16 (k) checking a patient record that has a selected said  
17 index code to find the first occurrence of said index code,  
18 (l) searching through said patient record backward in time  
19 starting with said first occurrence of said index code for a  
20 clear window,  
21 (m) searching through said patient record forward in time  
22 starting with said first occurrence of said index code for a  
23 clear window,  
24 (n) rejecting said patient records if no clear window is  
25 found,  
26 (o) establishing an Episode of Care if both said backward  
27 clear window and said forward clear windows are found,

(p) identifying a plurality of medical treatment patterns,  
(q) sorting said base data set information from said  
patient records by plurality of treatment patterns,  
(r) accessing a plurality of parameter tables,  
(s) populating said parameter tables with said base data  
from all said episodes of care for each said index code to  
provide summary statistics, and  
(t) sorting said parameter tables information  
chronologically, category and by said profile classes.

26. A method as recited in claim 19, wherein said step of  
reviewing a patient medical history record further comprises:

(a) accessing a plurality of parameter tables,  
(b) choosing a disease classification code for review,  
(c) accessing said disease classification description table  
to verify said diagnosis code is valid,  
(d) accessing said disease classification description table  
to verify said diagnosis code is an Index code,  
(e) prompting for a search for said selected disease  
classification code to list what index codes it may be associated  
with, if said chosen diagnosis is not listed as an Index code,  
(f) conducting a word search for the said diagnosis to the  
said disease classification codes in said Index code,  
(g) accessing said parameter tables to display selected  
profiles,  
(h) choosing source of said profiles from either said  
commercially available data set or said base data set, and

(i) accessing procedure description table and category table to ascertain description of procedure codes.

27. A method as recited in claim 19, wherein said step of screening said base data set for medical records further comprises:

- (a) accessing a age/gender table,
- (b) accessing a region statistic table,
- (c) accessing a Zip/Region table,
- (d) accessing a Identifying code for reporting a medical service statistic table,
- (e) accessing a specialty table,
- (f) selecting said reference profiles,
- (g) accessing said age/gender table to determine standard age ranges and/or gender selection for said selected profile,
- (h) accessing said region statistic table to determine adjustments due to particular geographic regions for said selected profile,
- (i) accessing said Zip/Region table to identify what region a particular geographic zip code falls within,
- (j) accessing said Identifying code for reporting a medical service Statistic table to identify what adjustments due to a particular medical specialty, and
- (k) accessing said Specialty table to determine what particular specialty groupings are suggested.

28. A method for analyzing a healthcare provider's billing patterns comprising the steps of:

(a) obtaining a base data set of medical provider billing information,

(b) verifying base data contained in said base data set, said verifying step including identifying the existence of errors in said base data,

(c) correcting errors identified during said verifying step,

(d) establishing an episode of care for a particular medical event,

(e) accessing and reviewing said medical record database, said accessing and reviewing comprising the steps of:

(i) establishing a plurality of criteria for searching parameters,

(ii) indexing said records in such a way as they are relationally related to each other, and

(iii) providing a format for the review of the accessed records,

(f) screening said base data set for medical records within an episode of care,

(g) obtaining a healthcare provider billing data set,

(h) comparing said healthcare provider billing data with said base data,

(i) reviewing a patient medical history record contained within said healthcare provider billing data set for the presence of a specific medical procedure, and

1 (j) generating a report which describes a relationship  
2 between said healthcare provider billing data and said base data.

3  
4 29. A method as recited in claim 28,  
5 wherein said step of obtaining a base data set of medical  
6 provider billing information further comprises:

7 (i) obtaining a commercially available data set comprising:

8 national profiles, and

9 regional profiles,

10 (ii) building base data set comprising patient records  
11 comprising:

12 line items,

13 Identifying code for reporting a medical service  
14 codes,

15 Index codes,

16 Dates of Service, and

17 Service Name,

18 (iii) determining a patient record from said base data set  
19 of patient records for an episode of care extraction process, and

20 (iv) manipulating said patient record to extrapolate  
21 pertinent information to conform with procedure logic.

22  
23 30. A method as recited in claim 28  
24 wherein said step of verifying base data contained in said  
25 base data set, further comprises:

26 (i) accessing a claims history comprising a plurality of  
27 line items,



(ii) accessing a plurality of description tables  
comprising:

(1) a Identifying code for reporting a medical  
service description table, and

(2) an disease classification description table,

(iii) checking said line items against said Identifying  
code for reporting a medical service description table to  
determine whether said line item is valid,

(iv) checking said line items against said disease  
classification description table to determine whether said line  
item is valid,

(v) counting invalid line items,

(vii) checking said line items against date of service,  
comprising:

(1) expanding into separate line items any said  
line items which contain "date of service from" and a "data of  
service to" where the said two dates are not the same,

(2) dating said services with a unique date of  
service beginning with said "date of service from" for first said  
line item and ending with said "date of service to" for last said  
line item, and

(viii) converting Identifying code for reporting a  
medical service code formats to standard Identifying code for  
reporting a medical service code format.

31. A method as recited in claim 28, wherein said step of  
correcting errors identified further comprises:

- 1           (a) detecting possible duplicate line items among said
- 2 line items,
- 3           (b) editing said claims history line items,
- 4           (c) detecting possible inappropriately billed services
- 5 among said services, and
- 6           (d) editing said inappropriately billed services.

7

8           32. A method as recited in claim 28, wherein said step of

9 comparing said healthcare provider billing data with said base

10 data further comprises:

- 11           (a) performing a data history search and producing an
- 12 information set therefrom,
- 13           (b) accessing a plurality of parameter tables comprising
- 14               (i) index codes, and
- 15               (ii) statistical criteria,
- 16           (c) comparing said information set against said index
- 17 codes,
- 18           (d) checking if said information set falls within a
- 19 defined statistical criteria,
- 20           (e) setting an indication if said information set falls
- 21 within said defined statistical criteria, and
- 22           (f) providing a variance alert describing differences
- 23 between said information set and said defined statistical
- 24 criteria.

25

26           33. A method as recited in claim 28, wherein said step of

27 generating a report which describes a relationship between said

healthcare provider billing data and said base data further  
comprises:

(a) compiling a comparison report comprising:

(i) a plurality of healthcare provider's utilization of  
Identifying code for reporting a medical service codes,

(ii) a reference set of utilization profiles,

(iii) a plurality of healthcare provider's utilization  
of disease classification codes,

(iv) a comparison of said healthcare provider's  
utilization of Identifying code for reporting a medical service  
codes against said reference set of utilization profiles,  
comprising

(A) number of said services,

(B) frequency of said services,

(C) chronological order of said services, and

(D) statistical information on said services,

comprising:

(1) range,

(2) mode, and

(3) confidence interval,

(v) a comparison of said healthcare provider's  
utilization of disease classification codes against said  
reference set of utilization profiles, comprising

(A) number of said services,

(B) frequency of said services,

(C) chronological order of said services, and

1 (D) statistical information on said services,  
2 comprising:

3 (1) range,

4 (2) mode, and

5 (3) confidence interval,

6 (b) compiling a provider practice profile report comprising:

7 (i) a summary of total Identifying code for reporting a  
8 medical service utilization by said healthcare provider during a  
9 specified time interval to provide a comparison against said  
10 reference data, and

11 (ii) a summary of total disease classification code  
12 utilization by said healthcare provider during a specified time  
13 interval to provide a comparison against said reference data.  
14

15 34. A method as recited in claim 28, wherein said step of  
16 establishing an episode of care for a particular medical event  
17 further comprises:

18 (a) designating a plurality of medical conditions that  
19 require a specific category procedure during the course of  
20 treatment,

21 (b) designating a plurality of medical conditions that have  
22 a qualifying circumstance,

23 (c) accessing a plurality of interrelational index tables,

24 (d) designating a particular index code,

25 (e) identifying a patient record with said particular index  
26 code on at least two said dates of service,

(f) rejecting patient records with less than two occurrences of said particular index code,

(g) searching an identified patient record for at least one occurrence of the said specific category procedure in said patient record,

(h) searching said identified patient record for at least one occurrence of said qualifying circumstance in said patient record,

(i) checking patient records against said Index Tables, to identify disease classification codes associated with the chosen said index code,

(j) searching patient records for any qualifying circumstance disease classification codes,

(k) creating a temporary file based on combining said disease classification codes that are associated with a given said index code,

(l) checking said patient record, identified as containing selected said index code, over the entire said patient record to find the first occurrence of said index code,

(m) searching through said patient record backward in time starting with said first occurrence of said index code for a clear window,

(n) searching through said patient record forward in time starting with said first occurrence of said index code for a clear window,

(o) rejecting said patient record if no clear window is found,

(p) establishing an Episode of Care if both said backward clear window and said forward clear windows are found,  
(q) selecting a plurality of medical treatment patterns,  
(r) sorting said base data set information from said patient records by plurality of treatment patterns,  
(s) a plurality of parameter tables,  
(t) populating said parameter tables with said base data from all said episodes of care for each said index code to provide summary statistics, and  
(u) sorting said parameter tables information chronologically, category and by said profile classes.

35. A method as recited in claim 28, wherein said step of reviewing a patient medical history record further comprises:

(a) accessing a plurality of parameter tables,  
(b) choosing a disease classification code for review,  
(c) accessing a disease classification description table,  
(d) accessing said disease classification description table to verify said diagnosis code is valid,  
(e) accessing said disease classification description table to verify said diagnosis code is an Index code,  
(f) prompting for a search for said selected disease classification code to list what index codes it may be associated with, if said chosen diagnosis is not listed as an Index code,  
(g) conducting a word search for the said diagnosis to the said disease classification codes in said Index code,

1           (h) accessing said parameter tables to display selected  
2 profiles,

3           (i) choosing source of said profiles from either said  
4 commercially available data set or said base data set, and

5           (j) accessing procedure description table and category  
6 table to ascertain description of procedure codes.  
7

8           36. A method as recited in claim 28, wherein said step of  
9 screening said base data set for medical records further  
10 comprises:

11           (a) selecting reference profiles,

12           (b) accessing an age/gender table to determine standard age  
13 ranges and/or gender selection for said selected profile,

14           (c) accessing a region statistic table to determine  
15 adjustments due to particular geographic regions for said  
16 selected profile,

17           (d) accessing a Zip/Region table to identify what region a  
18 particular geographic zip code falls within,

19           (e) accessing an Identifying code for reporting a medical  
20 service Statistic table to identify what adjustments due to a  
21 particular medical specialty, and

22           (f) accessing a Specialty table to determine what  
23 particular specialty groupings are suggested.  
24

25           37. In a general purpose computer system comprising:

26                   a central processing unit,

27                   dynamic memory,

an input device,  
an output device,  
a display device, and  
a mass storage device,  
a method for analyzing a healthcare provider's billing  
patterns comprising the steps of:  
    (a) storing a base data set of medical provider billing  
information on the mass storage device,  
    (b) storing said healthcare provider's billing information  
on the mass storage device,  
    (c) verifying said base data set to be used for comparison,  
by retrieving said base data set information from mass storage  
device, storing said base data set information in the dynamic  
memory, and displaying said base data set information on the  
display device,  
    (d) correcting errors discovered during said verification  
process, by utilizing the input device to edit said displayed  
base data set information,  
    (e) comparing said healthcare provider's billings with said  
comparison data, by retrieving said healthcare provider's  
billings from the mass storage device and storing in the dynamic  
memory, retrieving said comparison data from mass storage and  
storing in the dynamic memory, and performing a text field  
comparison between the said two sets of data stored in dynamic  
memory, and storing the result of the said comparison operation  
into mass storage, and



1 (f) generating reports for the purpose of describing the  
2 relationship between said healthcare provider's billings and  
3 comparison data by retrieving said comparison information from  
4 mass storage and writing said information to output device.

5

2025 RELEASE UNDER E.O. 14176

## Abstract of the Disclosure

A method and system for analyzing historical medical provider billings to statistically establish a normative utilization profile. Comparison of a medical provider's utilization profile with a normative profile is enabled. Based on historical treatment patterns and a fee schedule, an accurate model of the cost of a specific medical episode can be created. Various treatment patterns for a particular diagnosis can be compared by treatment cost and patient outcome to determine the most cost-effective treatment approach. It is also possible to identify those medical providers who provide treatment that does not fall within the statistically established treatment patterns or profiles.

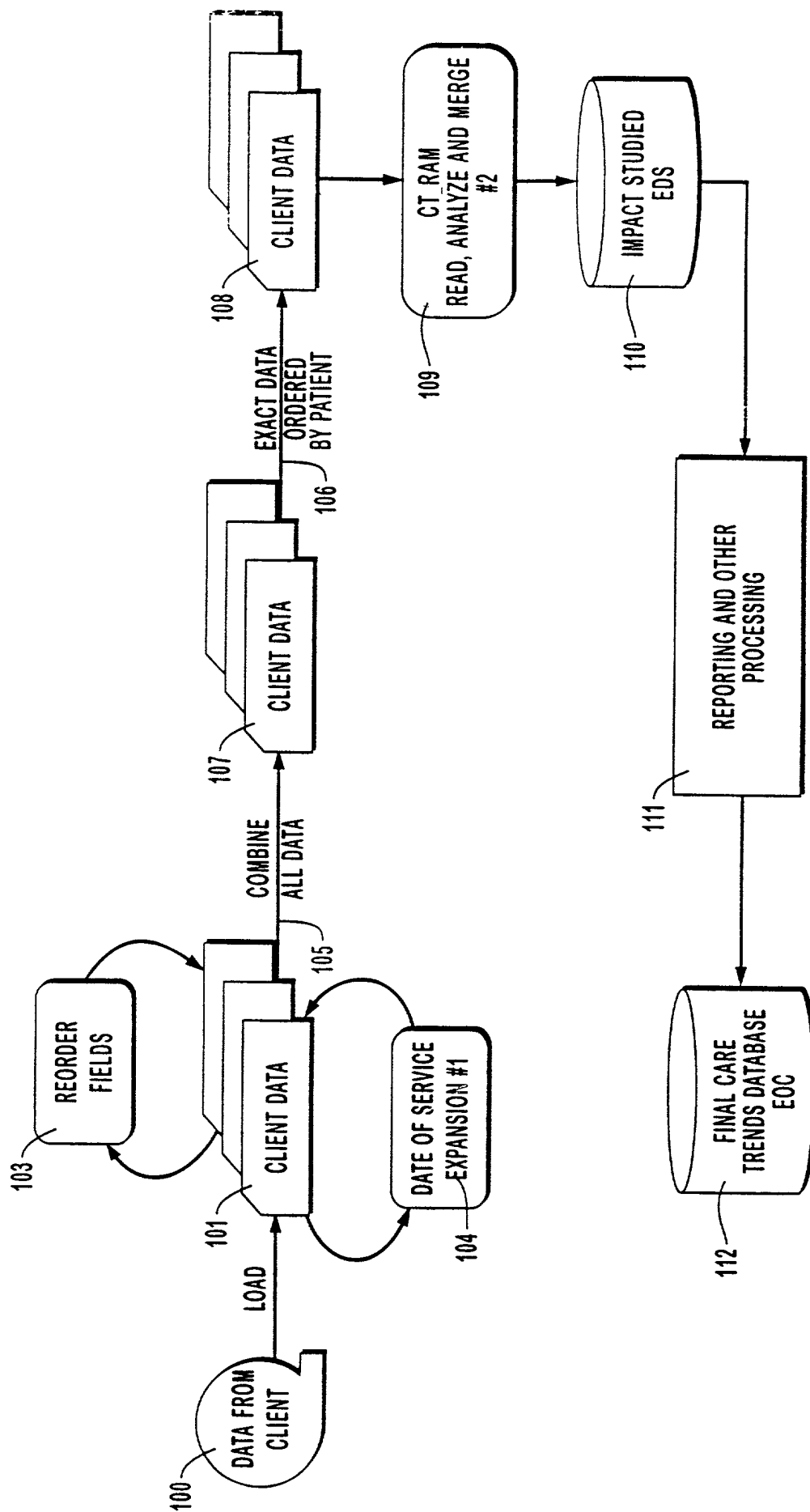


FIG. 1

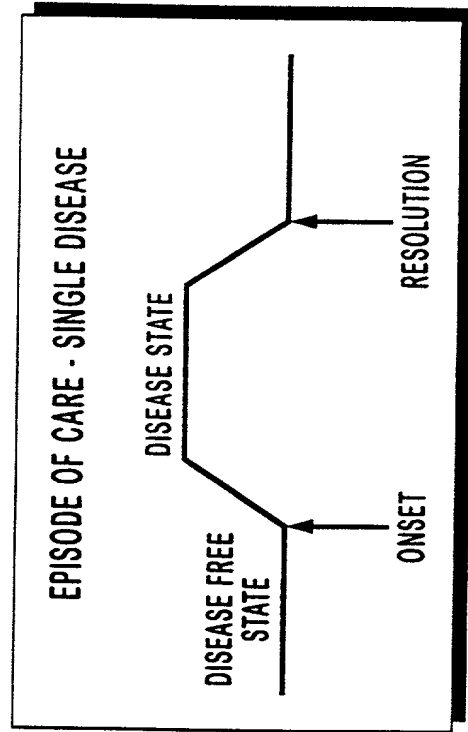


FIG. 2

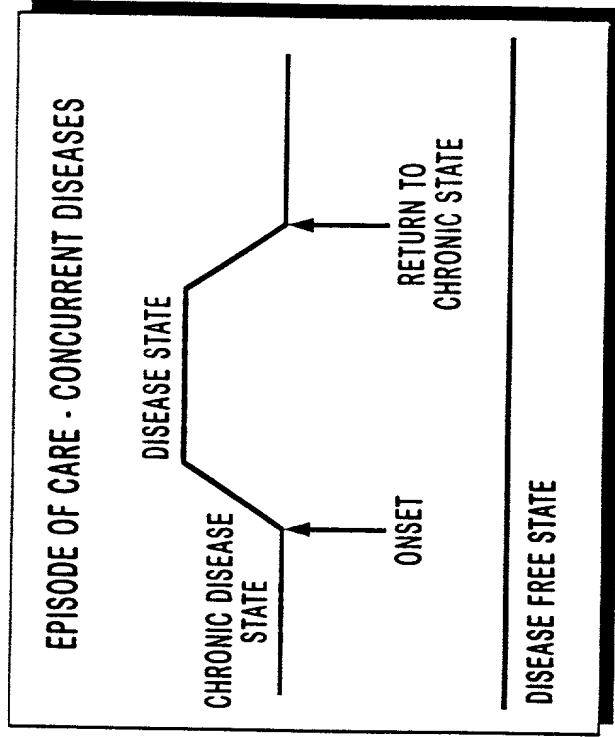


FIG. 3

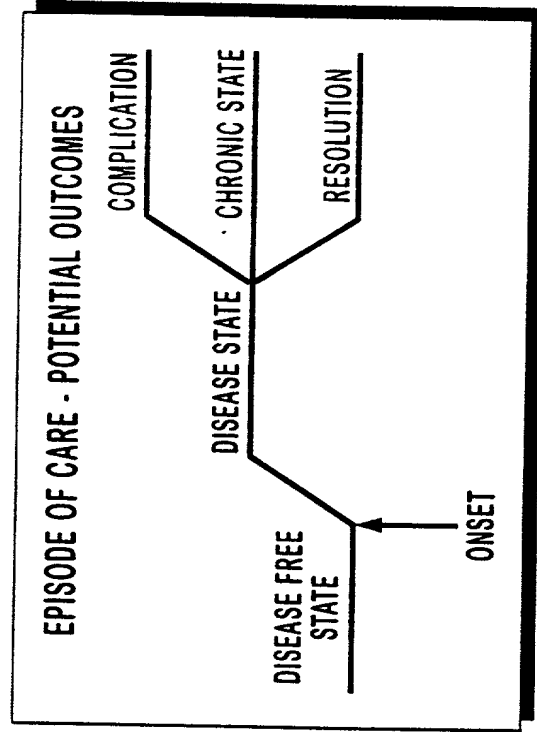


FIG. 4

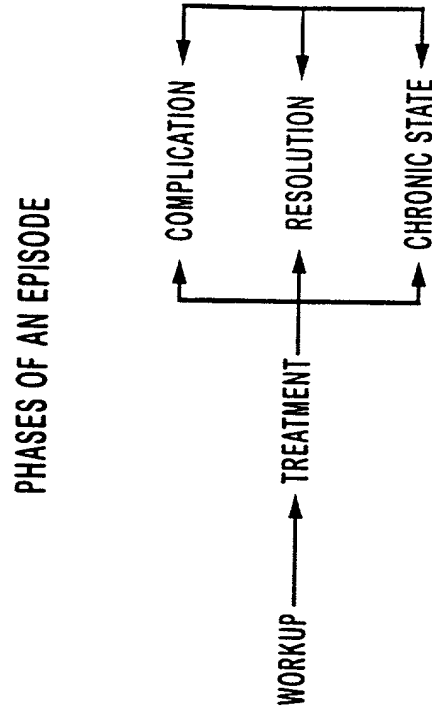


FIG. 5

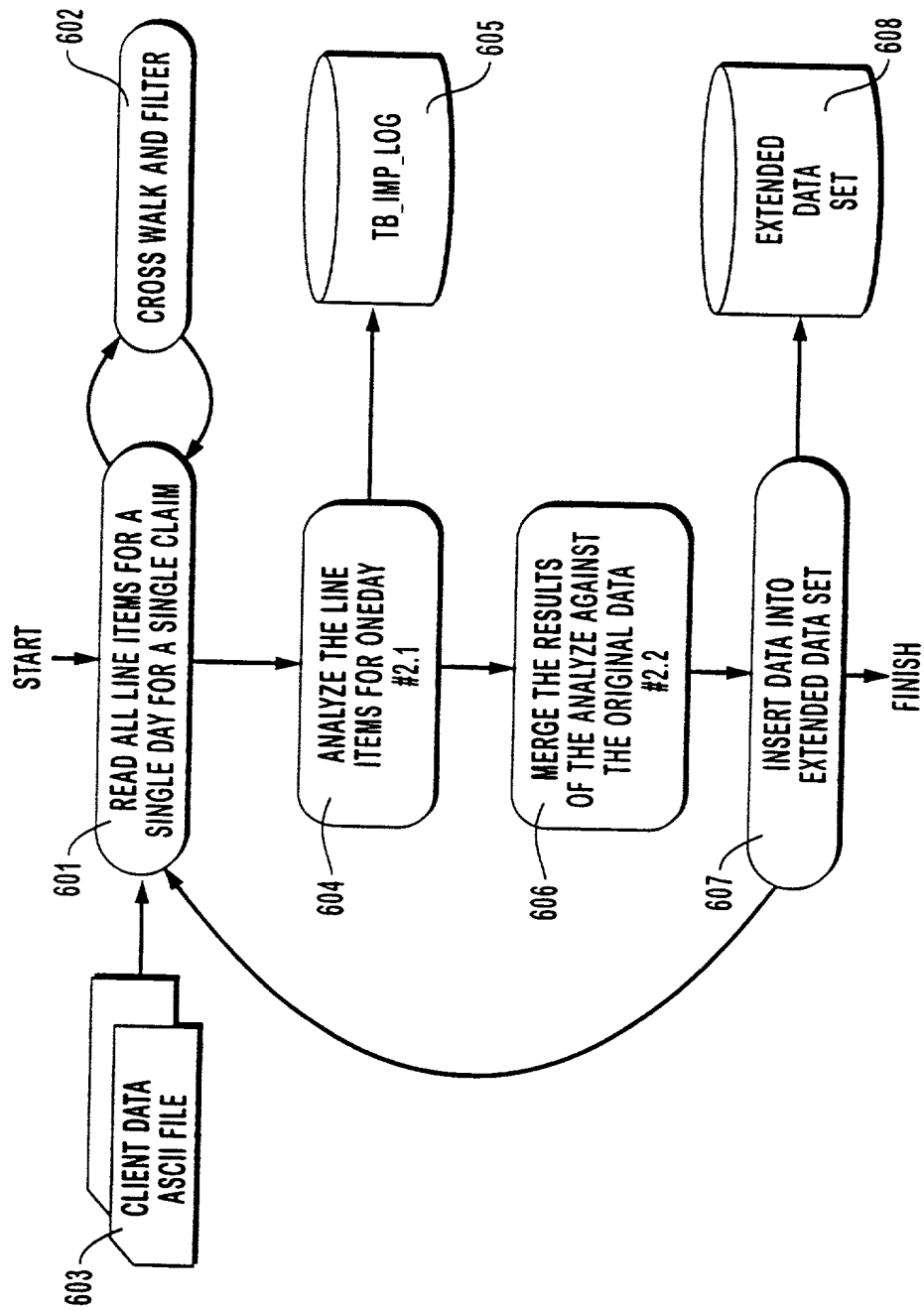


FIG. 6

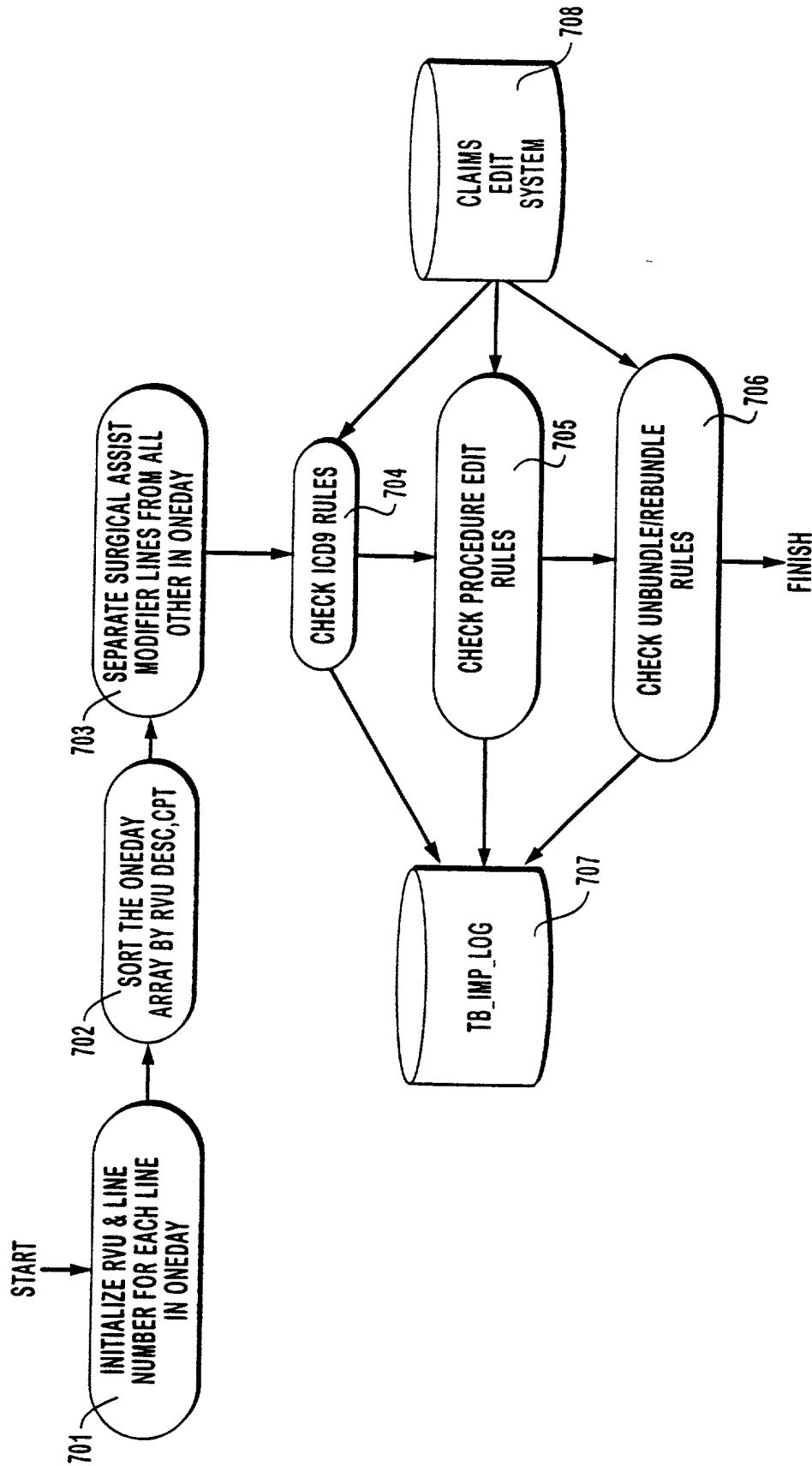


FIG. 7

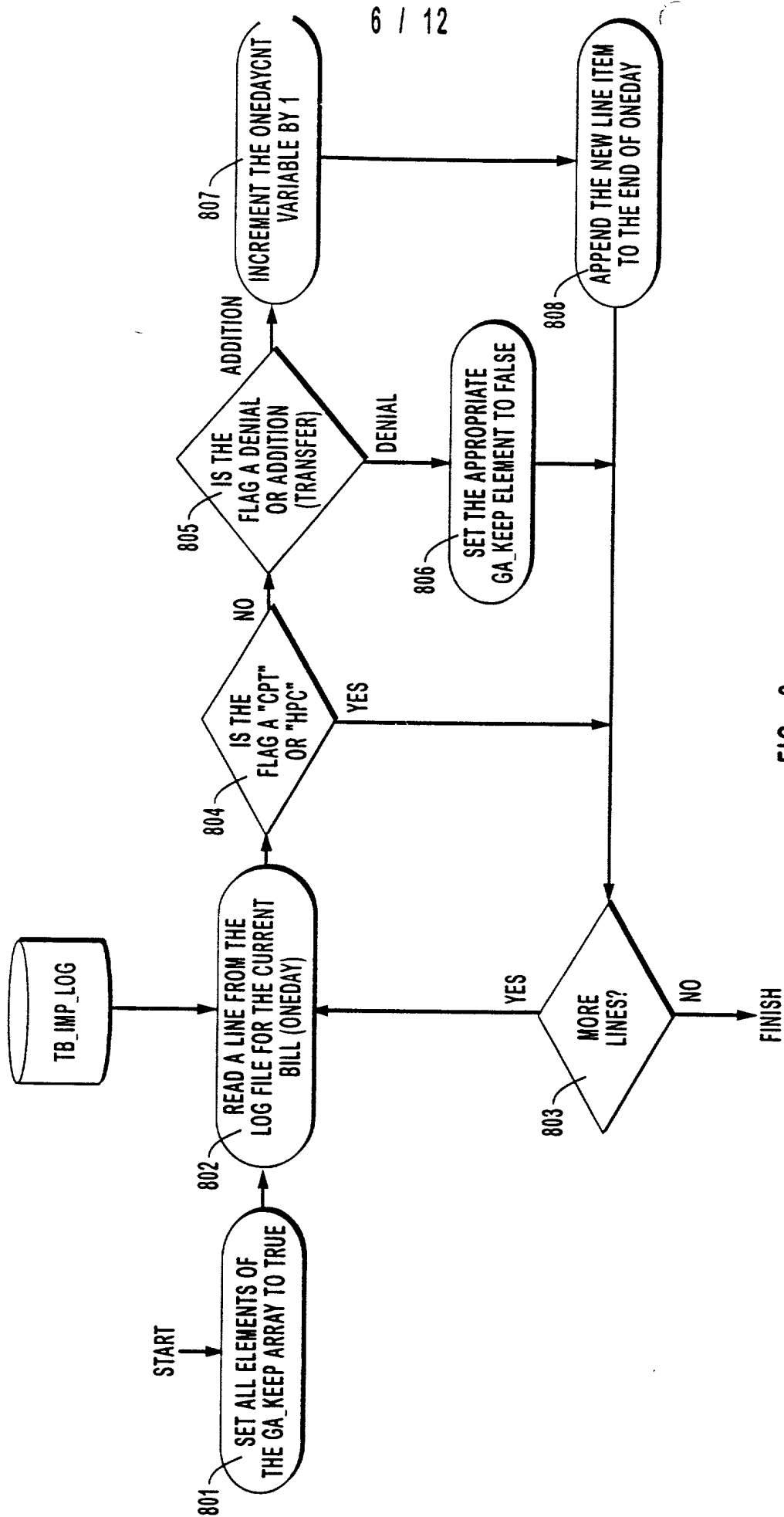


FIG. 8





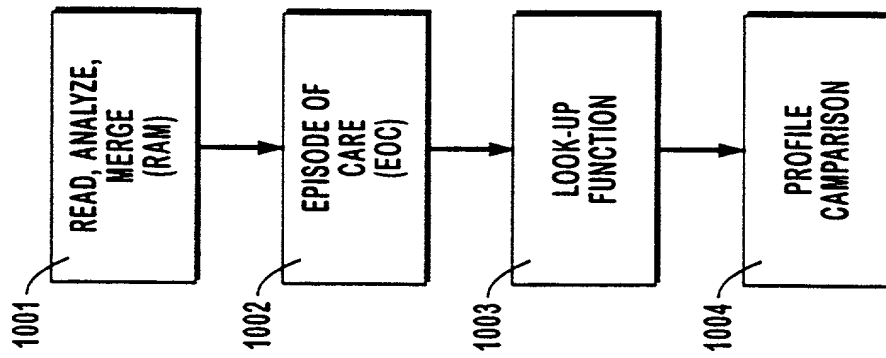


FIG. 10

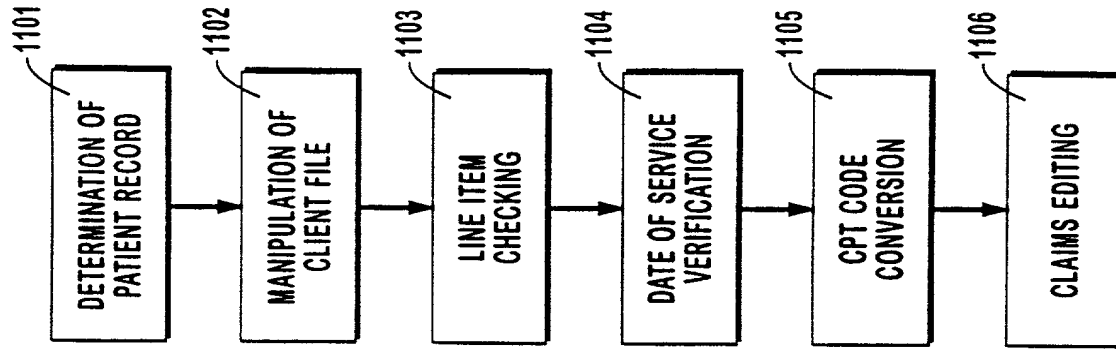


FIG. 11

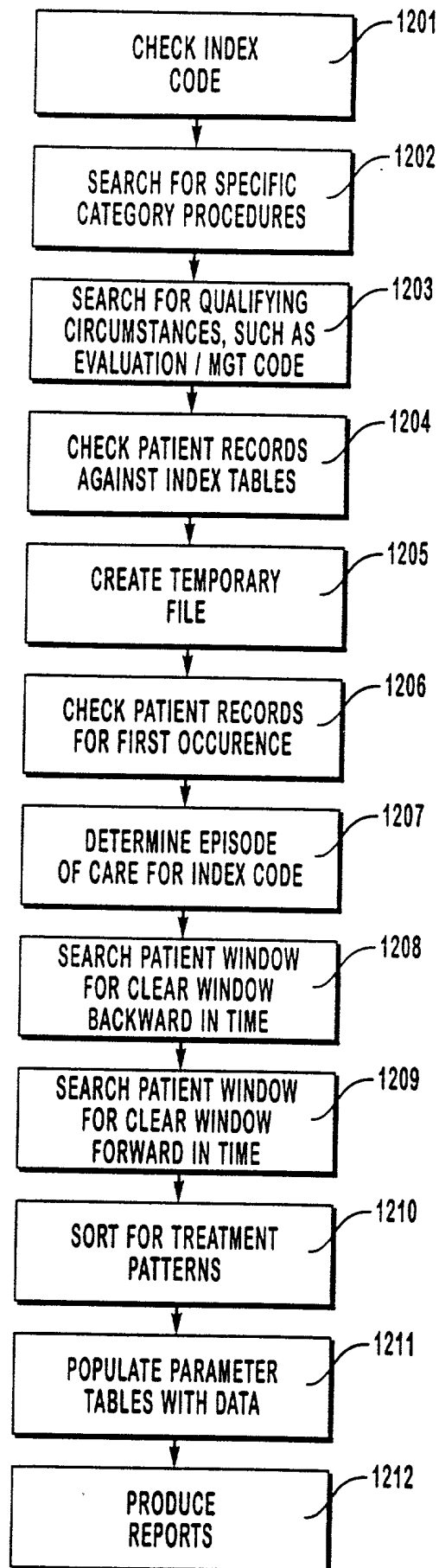


FIG. 12

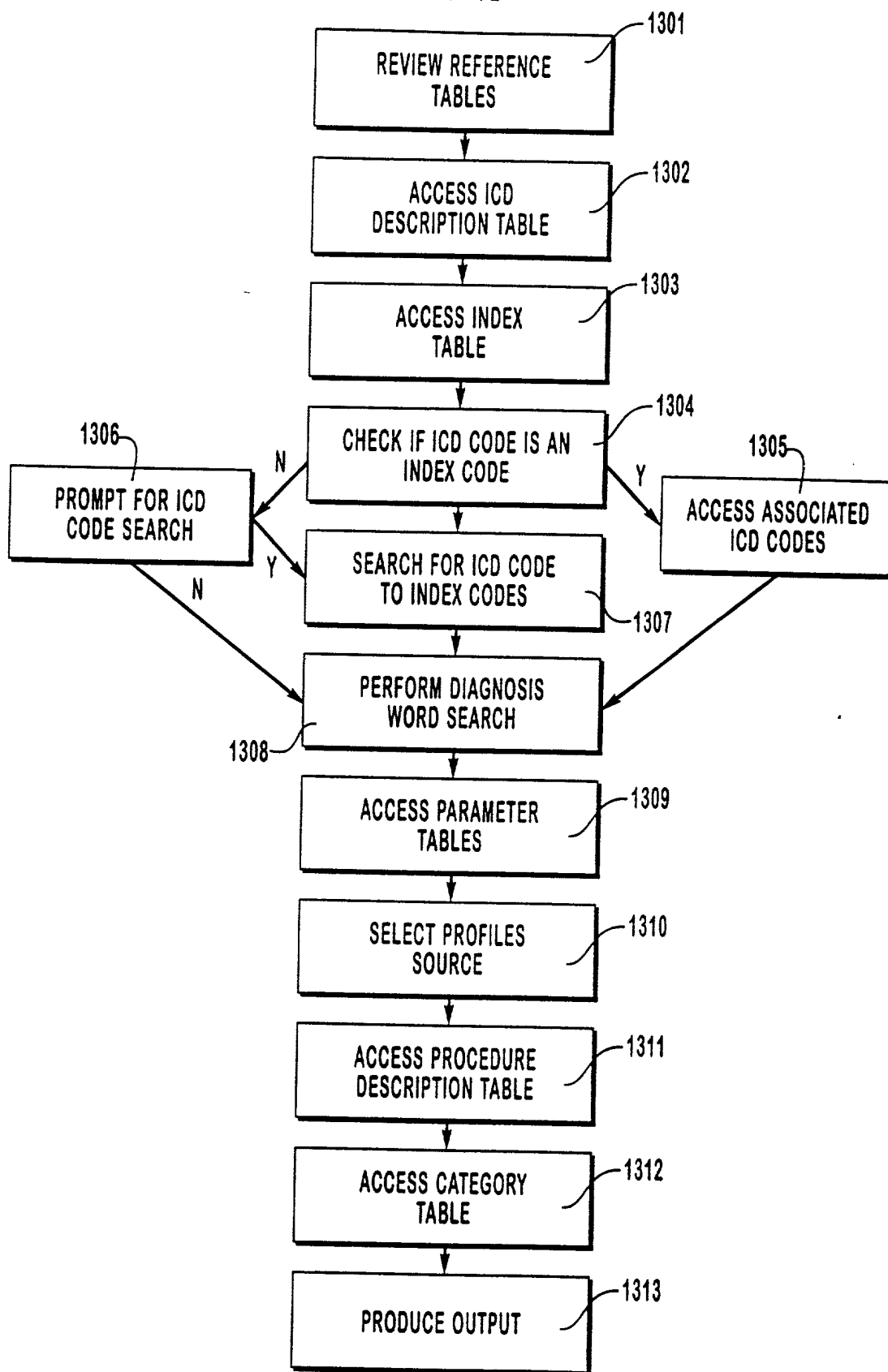


FIG. 13

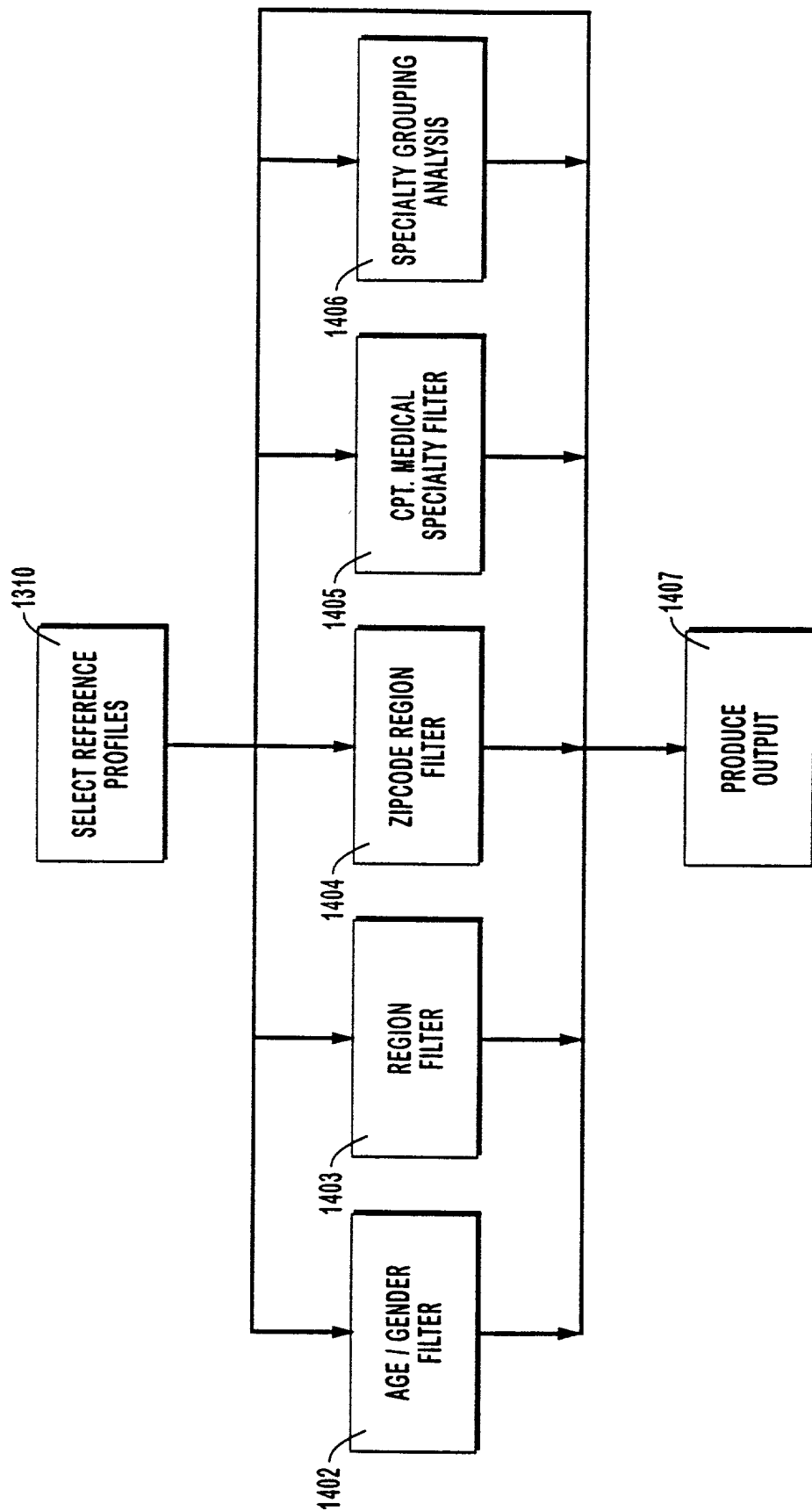


FIG. 14

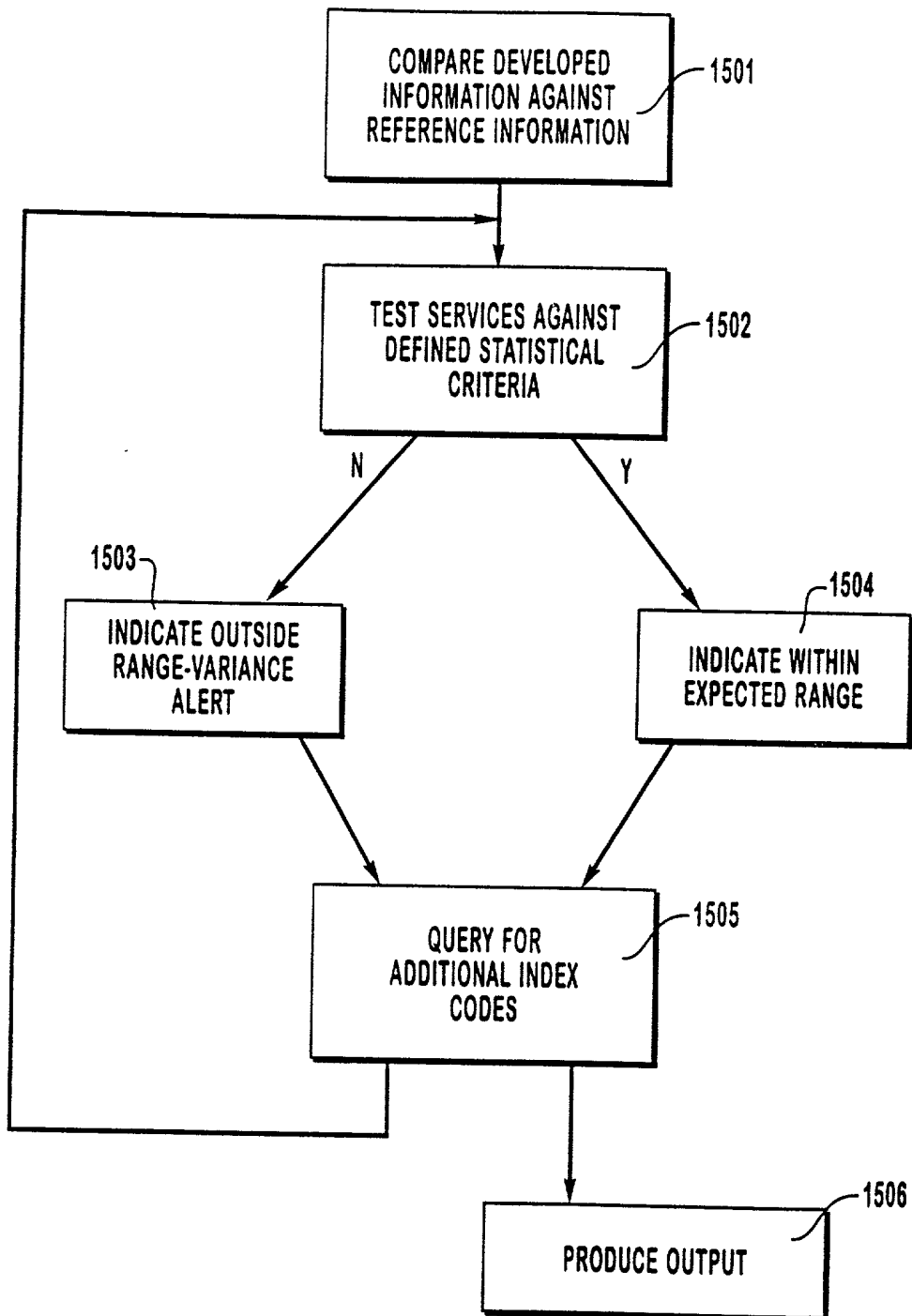


FIG. 15

S/N NEW FILING

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SEARE ET AL.	Examiner:	UNKNOWN
Serial No.:	NEW FILING	Group Art Unit:	UNKNOWN
Filed:	HEREWITH	Docket No.:	12344.2USC1
Title:	METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES		

CERTIFICATE UNDER 37 CFR 1.10:

"Express Mail" mailing label number: EL455018055US

Date of Deposit: November 10, 1999

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Assistant Commissioner for Patents, Washington, D.C. 20231.

By: Linda McCormick

Name: Linda McCormick

PROPOSED CHANGES TO THE DRAWINGS

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Applicants propose to amend Fig. 12 as shown in revised Fig. 12.

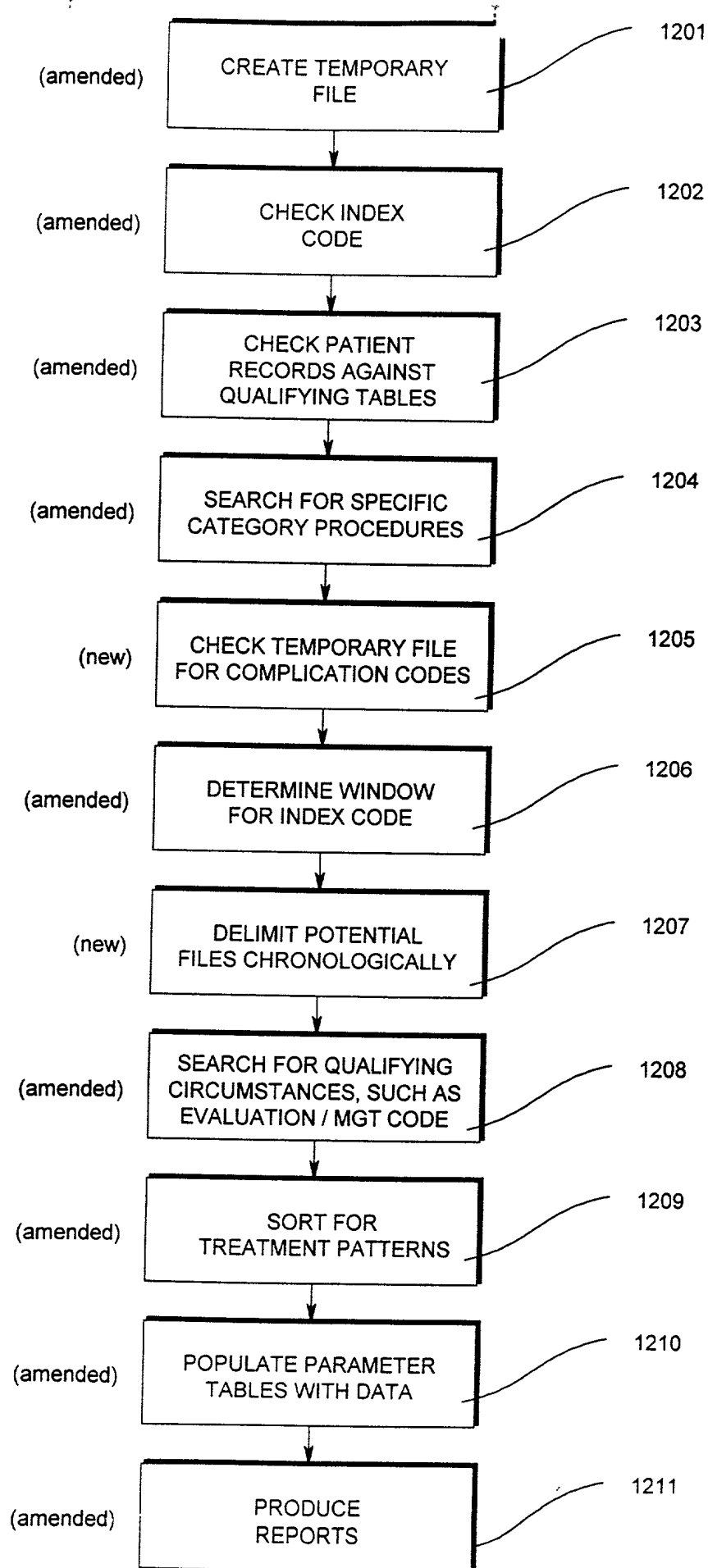
Respectfully submitted,

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Date: November 10, 1999

Alan G. Gorman

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Revised FIG. 12



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Michelle Willis  
Matthew Bentley  
Steven J. Wenzbauer  
Rod Fredette  
Vicki Sue Sennett

ASSIGNEE:

Medicode, Inc.

SERIAL NUMBER:

08/264,795

DATE FILED:

June 23, 1994

TITLE:

METHOD AND SYSTEM FOR GENERATING  
STATISTICALLY-BASED MEDICAL PROVIDER  
UTILIZATION PROFILES

ATTORNEY DOCKET:

1141 P

Commissioner of Patents and Trademarks  
Washington DC 20231

**DECLARATION FOR PATENT APPLICATION**

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES the specification of which was filed with the United States Patent and Trademark Office on June 23, 1994 and has been assigned Serial No. 08/264,795.

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I hereby appoint Jon C. Christiansen (Reg. No. 30,039), Lee A. Hollaar, Ph.D. (Reg. No. 33,901), Daniel P. McCarthy (Reg. No. 36,600) and Eleanor V. Goodall (Reg. No. 35,162) as my representatives and attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. All communications should be directed to the following address or telephone number:

Jon C. Christiansen.  
Daniel P. McCarthy  
Van Cott, Bagley, Cornwall & McCarthy  
P.O. Box 45340  
Salt Lake City, Utah 84145  
(801) 532-3333

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of inventor:

Jerry G Seare, MD

Residence of inventor:

Address:

1609 East 900 South

City:

Salt Lake City

State:

Utah

Zip Code:

84105

Citizenship:

US

Inventor's Signature:

Jerry G Seare, MD

Date:

8/31/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS: Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
Steven J. Wenzbauer  
Rod Fredette  
Vicki Sue Sennett

ASSIGNEE: Medicode, Inc.

SERIAL NUMBER: 08/264,795

DATE FILED: June 23, 1994

TITLE: METHOD AND SYSTEM FOR GENERATING  
STATISTICALLY-BASED MEDICAL PROVIDER  
UTILIZATION PROFILES

ATTORNEY DOCKET: 1141 P

Commissioner of Patents and Trademarks  
Washington DC 20231

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Full name of inventor:

Patricia A Smith-Wilson

Residence of inventor:

Address:

850 North Highway 89

City:

North Salt Lake

State:

Utah

Zip Code:

84054

Citizenship:

United States

Inventor's Signature:

Patricia A Wilson

Date:

8/31/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
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Rod Fredette  
Vicki Sue Sennett

ASSIGNEE:

Medicode, Inc.

SERIAL NUMBER:

08/264,795

DATE FILED:

June 23, 1994

TITLE:

METHOD AND SYSTEM FOR GENERATING  
STATISTICALLY-BASED MEDICAL PROVIDER  
UTILIZATION PROFILES

ATTORNEY DOCKET:

1141 P

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Full name of inventor:

Kurt Van Krogen

Residence of inventor:

Address:

294 South Flint Street

City:

Layton

State:

Utah

Zip Code:

84041

Citizenship:

US

Inventor's Signature:

Kurt Van Krogen

Date:

9/1/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS: Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
Steven J. Wenzbauer  
Rod Fredette  
Vicki Sue Sennett

ASSIGNEE: Medicode, Inc.

SERIAL NUMBER: 08/264,795

DATE FILED: June 23, 1994

TITLE: METHOD AND SYSTEM FOR GENERATING  
STATISTICALLY-BASED MEDICAL PROVIDER  
UTILIZATION PROFILES

ATTORNEY DOCKET: 1141 P

Commissioner of Patents and Trademarks  
Washington DC 20231

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Full name of inventor:

JEAN ANDREA MATTEI

Residence of inventor:

Address:

955 E CREEK HILL LANE #20

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MIDVALE

State:

UTAH

Zip Code:

84047

Citizenship:

USA

Inventor's Signature:

Jean A. Mattei

Date:

8/31/94



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
Steven J. Wenzbauer  
Rod Fredette  
Vicki Sue Sennett

ASSIGNEE:

Medicode, Inc.

SERIAL NUMBER:

08/264,795

DATE FILED:

June 23, 1994

TITLE:

METHOD AND SYSTEM FOR GENERATING  
STATISTICALLY-BASED MEDICAL PROVIDER  
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1141 P

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Full name of inventor:

EILEEN K. SNYDER

Residence of inventor:

Address:

1390 SANDY HILLS DRIVE

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State:

UTAH

Zip Code:

84093

Citizenship:

U.S.A.

Inventor's Signature:

Eileen K. Snyder

Date:

8/31/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
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Full name of inventor:

Candace C. Wahlstrom, RN

Residence of inventor:

Address:

City:

State:

Zip Code:

41 W. Girard Avenue  
Salt Lake City  
Utah  
84103

Citizenship:

American

Inventor's Signature:

Candace C. Wahlstrom RN

Date:

8/31/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Mattey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
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Full name of inventor:

Michelle Willis

Residence of inventor:

Address:

458 E. 10375 St.

City:

Sandy

State:

Utah

Zip Code:

84070

Citizenship:

U.S.

Inventor's Signature:

Michelle Willis

Date:

8-31-94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
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Full name of inventor: MATTHEW R. BENTLEY

Residence of inventor:

Address: 7165 S. CALLIE DR.

City: WEST JORDAN

State: UT

Zip Code: 84084

Citizenship: U.S.

Inventor's Signature: Matthew Bentley

Date: 8/31/94



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
Matthew Bentley  
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Vicki Sue Sennett

ASSIGNEE:

Medicode, Inc.

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Full name of inventor:

Steven J. Weitzbauer

Residence of inventor:

Address:

209 West 3500 S

City:

Bountiful

State:

Utah

Zip Code:

84010

Citizenship:

U.S.

Inventor's Signature:

Steven J. Weitzbauer

Date:

9/6/94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:

Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
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Full name of inventor:

ROONEY FREDETTE

Residence of inventor:

Address:

2212 E 2700 S

City:

SLC ~~84~~

State:

UTAH

Zip Code:

84109

Citizenship:

USA

Inventor's Signature:

ROONEY F. FREDETTE

Date:

8-31-94

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS: Jerry G. Seare, M.D.  
Patricia Smith-Wilson  
Kurt VanWagoner  
Jean A. Matthey  
Eileen K. Snyder  
Candace Wahlstrom  
Michelle Willis  
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ASSIGNEE: Medicode, Inc.

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8/31/94

## **MICROFICHE APPENDIX**

### **METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES**

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The materials which follow, including computer source code and file layouts, are provided in the interest of full disclosure and are illustrative of one preferred embodiment of the invention entitled "METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES." Numerous other embodiments of the invention and the inventive concept may include materials which differ from the materials provided herein. Each of those other embodiments of the invention and the inventive concept are intended to be comprehended within the scope of the patent claims of the present invention, and the materials provided herein are not intended to limit the scope of the present invention.



```

#-----
#      Module Name :   Pp_comp.4gl
#      Version.Edit:   1.0
#      Date Written:   04/01/94
#      Written By    :   Rodney R. Fredette
#
#      Description: This program counts the number of patients and EOCs
#                  within a user specified index code. Also counts the
#                  number of patients with complicating factors and the
#                  number of EOCs with complicating factors.
#
#      Edit History:
# Edit      Date      By      Reason
# ----      -
# 1      4/7/94      rrf      add logic to create a temp index table which
#                               combines the data from the index_detail table
#                               with associated data from the index_global
#                               table to form a new temporary index_detail
#                               table with all necessary data. Also populate
#                               the new EOC table with each occurrence of an EOC
#                               as determined by this programs logic.
#
# 2      5/25/94      rrf      change logic for building TEMP_DATA table which
#                               which holds all detail for related codes. Now
#                               only retrieve detail data for patients who have
#                               at least one icd9 code in the index (indicator =
#                               "I" in the TMP_INDEX table.
#-----

```

database eds

```

#
globals
define
  q_text      char(400),
  quote       char(1),
  pd          record like gendbs:prtddev.*,
#
# the following are user supplied variable.
#

```

```

  ir          record      # ir = input record, data from user
                  index          like index_detail.index,
                  ok_yn          char(1) #Is data input correct?
                  end record,
  init_flag   smallint,
  q_text      char(400),
  quote       char(1)
end globals

```

```

main
define
  i          record
            indicator      like index_detail.indicator
            end record,
  l          record
            date_of_serv   like e_line.date_of_serv,
            pos            like e_line.pos,
            tos            like e_line.tos,
            proc           like e_line.cpt,
            mod_1          like e_line.mod_1,

```

```

        icd1          like e_line.icd1,
        charge        like e_line.charge
    end record,
c      record like e_claim.*,
q      record
        patient       like e_claim.patient,
        relationship   like e_claim.relationship,
        sex           like e_claim.sex,
        date_of_serv   like e_line.date_of_serv,
        cpt           like e_line.cpt,
        icd1          like e_line.icd1,
        category       like category.category
    end record,
new_cat       like category.category,
eoc_profile   like qual_master.profile,
prev_eoc,
cur_eoc_num   integer,
ces_rdate     date,
new_stat      char(2),
msg           char(75),
passed,
cur_by        smallint,
ok_flag,
jcount,
icount        integer,
rule_err      char(2),
prev_pat      like e_claim.patient,
prev_rel      like e_claim.relationship,
prev_sex      like e_claim.sex

clear screen
defer interrupt
call startlog("pp_comp.log")

initialize ir.* to null
#
# Check for command line arguments
#
if num_args() >= 1 then
    let ir.index = upshift(arg_val(1))
else
    let msg = 'Pp_comp:Must supply index code on comand line!'
    call errorlog(msg)
    call lSend_mail (get_user(), msg)
    exit program
end if

let msg = "Starting: ", ir.index
call errorlog(msg)

start report to "pp_comp.rpt"

call errorlog ("Creating TMP_INDEX table")
call lMake_index(ir.index)
#
# Do all patient level qualifying checks first. Determine which
# patients have data for the user specified index, then build a
# temporary patient table containing all detail (line) data needed
# to check qualifying conditions. Currently, this consists of:

```

```

#      date_of_serv, cpt, icd1
#
# First build temp table (temp_data) containing all data needed
# for patients who have at least one occurrence of the main index
#
call errorlog ("building temp_data")

select unique patient, relationship, sex
  from e_line lx, e_claim cx, tmp_index ix
  where lx.e_claim_id = cx.e_claim_id and
        lx.icd1 = ix.icd9 and
        ix.indicator in ("I", "MI") and
        cx.e_claim_id != 0
  into temp tmp_patient

select cx.*, lx.date_of_serv, lx.pos, lx.tos, lx.cpt,
       lx.mod_1, lx.icd1, lx.charge, ix.indicator
  from e_line lx, e_claim cx, tmp_index ix, tmp_patient ip
  where lx.e_claim_id = cx.e_claim_id and
        lx.icd1 = ix.icd9 and
        cx.patient = ip.patient and
        cx.relationship = ip.relationship and
        cx.sex = ip.sex and
        cx.e_claim_id != 0
  into temp temp_data

call errorlog ("creating index")
create index i_td1 on temp_data(patient, relationship, sex)
#
# Create yet another temp table to hold the category info, because
# it seems to take too long accessing the CATEGORY table using
# the between clause
#
call errorlog ("Making Cat FILE")

create temp table cat_file (
  proc      char(5),
  category   char(4))
in ucrspace1 extent size 200;

prepare get_cat1_state from
  "select min(category) from category where ? between beg_cpt and end_cpt"
declare get_cat1 cursor for get_cat1_state

declare ins_cat cursor for
  insert into cat_file values (q.cpt, q.category)
open ins_cat

declare bld_cat cursor for
  select unique cpt from temp_data

let icount = 0
foreach bld_cat into q.cpt
  if int_flag then
    call stop_now()
  end if

  let icount = icount + 1
  if icount mod 100 = 0 then
    let msg = "Cat count=", icount using "<<<<,<<&"

```

```

        call errorlog (msg)
    end if

    let q.category = " "
    open get_cat1 using q.cpt
    fetch get_cat1 into q.category
    close get_cat1

    put ins_cat
end foreach
close ins_cat

let msg = "Cat count=", icount using "<<<<, <<&"
call errorlog (msg)

create unique index i_catf1 on cat_file(proc);

call errorlog ("Starting Main Process")

let quote = "\"\"

prepare get_cat_state from
    "select category from cat_file where proc = ?"
declare get_cat cursor for get_cat_state
#
# Next scroll thru each patient and use each patients data to fill
# temp table (temp_qual) to be used for qualifer checks
#
create temp table temp_qual (
    date_of_serv      date,
    cpt                char(5),
    icd1               char(6),
    category           char(4))
in ucspace1 extent size 100 next size 100;

declare upat_curs cursor for
    select patient, relationship, sex, date_of_serv, cpt, icd1
    from temp_data
    order by 1,2,3

prepare del_temp_data from
    "delete from temp_data where patient = ? and relationship = ? and sex = ?"

prepare del_qual from "delete from temp_qual"

declare qual_ins cursor for
    insert into temp_qual values (q.date_of_serv, q.cpt, q.icd1, q.category)
open qual_ins

let icount = 0
let jcount = 0

call errorlog ("Performing patient qual checks")
foreach upat_curs into q.*
    if int_flag then
        call stop_now()
    end if

    let q.category = " "
    open get_cat using q.cpt

```



```

let icount = 0
foreach ref_curs into c.*, l.*, i.*
    if int_flag then
        call stop_now()
    end if

    let icount = icount + 1
    if icount mod 10000 = 0 then
        let msg = "count=", icount using "<<,<<<,<<&"
        call errorlog (msg)
    end if

    let cur_by = year(l.date_of_serv) - c.age      # calc birth year

    output to report r_edit(c.*, l.*, i.*, cur_by)
end foreach

let msg = "count=", icount using "<<,<<<,<<&"
call errorlog (msg)

finish report r_edit
#
# Take care of qualifying conditions that may make currently valid
# EOC's invalid. Delete all patient data found with a complicating code
#
prepare del_comp_eoc from
    "delete from eoc where e_claim_id = ?"

call errorlog ("updating Comp Patients")
declare comp_pat_curs cursor for
    select unique e_claim_id
    from e_claim cc, pat_eoc pe
    where cc.patient = pe.patient and
          cc.relationship = pe.relationship and
          cc.sex = pe.sex

let icount = 0
foreach comp_pat_curs into c.e_claim_id
    let icount = icount + 1
    if icount mod 1000 = 0 then
        let msg = "count=", icount using "<<,<<<,<<&"
        call errorlog (msg)
    end if

    execute del_comp_eoc using c.e_claim_id
end foreach

let msg = "count=", icount using "<<,<<<,<<&"
call errorlog (msg)
call errorlog ("done with comp Patients")
#
# Perform EOC qualifier checks on all valid EOCs
#
call errorlog ("Performing EOC Qualifier Checks")

declare qeoc_curs cursor for
    select eoc_num, date_of_serv, proc, icd1
    from eoc
    where index = ir.index and
          eoc_status = "Y"
    order by eoc_num

```

```

prepare upd_eoc from
    "update eoc set profile = ? where eoc_num = ?"

open qual_ins
let icount = 0
foreach qeoc_curs into cur_eoc_num, q.date_of_serv, q.cpt, q.icd1
    if int_flag then
        call stop_now()
    end if

    let q.category = " "
    open get_cat using q.cpt
    fetch get_cat into q.category

    if icount = 0 then
        let prev_eoc = cur_eoc_num
    end if

    let icount = icount + 1
    if icount mod 1000 = 0 then
        let msg = "QEOC count=", icount using "<<<<<<<&"
        call errorlog (msg)
    end if

    if cur_eoc_num != prev_eoc then
        close qual_ins

        let eoc_profile = " "
        call qual_check("E") returning passed, eoc_profile, rule_err
        execute upd_eoc using eoc_profile, prev_eoc

        execute del_qual
        open qual_ins

        let prev_eoc = cur_eoc_num
    end if

    put qual_ins
end foreach
#
# Take care of last patient
#
close qual_ins

let eoc_profile = " "
call qual_check("E") returning passed, eoc_profile, rule_err
if not passed then
    let msg = "EOC FAIL: ", cur_eoc_num, " Rule: ", rule_err
    call errorlog (msg)
    let new_stat = rule_err
end if
execute upd_eoc using eoc_profile, cur_eoc_num
#
# Grab the category based on procedure code
#
call errorlog ("Appending Category data")

prepare upd_eoc_cat from
    "update eoc set category = ? where proc = ?"

```

```

declare cat_curs cursor for
  select unique proc from eoc
    where index = ir.index

let icount = 0
let jcount = 0
foreach cat_curs into l.proc
  let icount = icount + 1
  if icount mod 100 = 0 then
    let msg = "Unique Proc Count: ", icount using "<<,<&",
      " New Cat Count: ", jcount using "<<,<&"
    call errorlog(msg)
  end if

  let new_cat = " "
  open get_cat using l.proc
  fetch get_cat into new_cat
  if status != notfound then
    let jcount = jcount + 1
    execute upd_eoc_cat using new_cat, l.proc
  end if
  close get_cat
end foreach

let msg = "Unique Proc Count: ", icount using "<<,<&",
  " New Cat Count: ", jcount using "<<,<&"
call errorlog(msg)

let msg = "Done: ", ir.index
call errorlog (msg)
end main

report r_edit(c, l, i, cur_by)
define
  i
    record
      indicator like index_detail.indicator
    end record,
  l
    record
      date_of_serv like e_line.date_of_serv,
      pos like e_line.pos,
      tos like e_line.tos,
      proc like e_line.cpt,
      mod_1 like e_line.mod_1,
      icd1 like e_line.icd1,
      charge like e_line.charge
    end record,
  c
    record like e_claim.*,
  cur_by
    smallint,
  cur_eoc_num
    integer,
  cur_status
    like eoc.eoc_status,
  co_name,
  hdr_line1,
  hdr_text,
  hdr2_text
    char(78),
  x1, x2, x3
    smallint,
  ascii_val
    char(30),
  new_status
    like eoc.eoc_status,
  prev_dos
    date,
  ok_flag,

```



```

win_max,                #size of EOC window
eoc_cnt_for_pat,
cur_eoc_is_bad,
an_eoc_was_bad      smallint,
eoc_cnt,
pat_cnt,
eoc_comp,
pat_comp,
grp_tot_eoc_comp      integer

```

output

```

top margin 0
left margin 0
bottom margin 0
page length 66

```

```

# order by c.patient, c.relationship, cur_by, c.sex, l.date_of_serv
order by c.patient, c.relationship, c.sex, l.date_of_serv

```

format

```

first page header
let q_text =
    "select count(*) from tmp_index where icd9 = ? and ",
    "indicator = ", quote, "C", quote
prepare cnt_complic_state from q_text
declare cnt_complic cursor for cnt_complic_state
#
# Get EOC window size for this index
#
select beg_win into win_max
from window
where staging in
    (select staging from index where index = ir.index)
if win_max is null or win_max <= 0 then
    call errorlog ("Invalid EOC window")
    exit program
end if
#
# create temporary table to store patients who have at lease one
# complicating factor. Later, all the EOC status for this patient will
# will tbe set to 'CP'
#
create temp table pat_eoc (
    patient      char(15),
    relationship  char(1),
    sex          char(1)) in ucrspace1;

declare ins_pat_eoc cursor for
    insert into pat_eoc values (c.patient, c.relationship, c.sex)
open ins_pat_eoc

declare eoc_ins cursor for
    insert into eoc values
        (cur_eoc_num, ir.index, cur_status, " ", i.*, l.*, c.e_claim_id, " ")
open eoc_ins

select max(eoc_num) into cur_eoc_num from eoc
if cur_eoc_num is null or cur_eoc_num <= 0 then
    let cur_eoc_num = 1

```

```

end if

let eoc_cnt = 0
let pat_cnt = 0
let eoc_comp = 0
let pat_comp = 0
let grp_tot_eoc_comp = 0

let hdr_text = "Care Trends EOC Comparison Report"
let hdr2_text = "For Index Code: ", ir.index
let co_name = "MEDICODE, INC."
let x1 = 41 - (length(co_name) / 2)
let x2 = 41 - (length(hdr_text) / 2)
let x3 = 41 - (length(hdr2_text) / 2)
#
# Check if I/O device needs to be configured
#
let ascii_val = " "
call parse_ascii(pd.esc_code, "N") returning ok_flag, ascii_val
if ok_flag then
    print ascii_val
else
    print
end if

print
column 1, "Date: ", today using "MM/DD/YY",
column x1, co_name clipped,
column 65, "Page: ", pageno using "<<#"

print
column 01, "Time: ", time,
column x2, hdr_text clipped

let hdr_line1 =
column 1, "pp_comp.4gl",
column x3, hdr2_text clipped

print hdr_line1
skip 5 lines

page header
print
column 01, "Date: ", today using "MM/DD/YY",
column x1, co_name clipped,
column 65, "Page: ", pageno using "<<#"

print
column 01, "Time: ", time,
column x2, hdr_text clipped

print hdr_line1
skip 5 lines

before group of c.sex
let pat_cnt = pat_cnt + 1
let eoc_cnt = eoc_cnt + 1
let prev_dos = l.date_of_serv
let cur_eoc_is_bad = false
let an_eoc_was_bad = false

```

```

let eoc_cnt_for_pat = 1
let cur_status = "V"
let cur_eoc_num = cur_eoc_num + 1
# print "rel= ", c.relationship, " sex= ", c.sex
#
# Take care of the first qualifying condition that may make the patient
# invalid. The patient history must contain at least two related codes.
# if not, then set the US column = "QP" (disqualified Patient).
# Set ok_flag = false so no EOC logic will be done.
#
let ok_flag = true

on every row
  open cnt_complic using l.icd1
  fetch cnt_complic into ok_flag
  close cnt_complic

  if ok_flag then
    #
    # we have encountered a complicating ICD, but has this EOC
    # already been flagged as bad? If not, then add 1 to the running
    # total of the number of EOC's with complicating factors (EOC_COMP)
    #
    if not cur_eoc_is_bad then
      let eoc_comp = eoc_comp + 1
      let an_eoc_was_bad = true
      let cur_eoc_is_bad = true
      let cur_status = "C"
    end if
  end if

  #
  # Now look for a gap in service dates of 60 or more days. If one
  # is found then a new EOC is starting.
  #
  if l.date_of_serv - prev_dos >= win_max then
    #
    # new EOC
    #
    let eoc_cnt = eoc_cnt + 1
    let cur_eoc_is_bad = false
    let eoc_cnt_for_pat = eoc_cnt_for_pat + 1
    let cur_eoc_num = cur_eoc_num + 1
    let cur_status = "V"
  end if

  let prev_dos = l.date_of_serv

  put eoc_ins

after group of c.sex
  flush eoc_ins

  if an_eoc_was_bad then
    put ins_pat_eoc
    let grp_tot_eoc_comp = grp_tot_eoc_comp + eoc_cnt_for_pat
    let pat_comp = pat_comp + 1
  end if

on last row

```

```

close eoc_ins
close ins_pat_eoc

```

```

print
    column 56, "% of"

```

```

print
    column 10, "Totals:",
    column 34, "Count",
    column 45, "Comp",
    column 56, "Count"

```

```

print
    column 10, "-----",
    column 34, "-----",
    column 45, "-----",
    column 56, "-----"

```

```

print
    column 10, "Patient",
    column 30, pat_cnt using "#,###,##&",
    column 40, pat_comp using "#,###,##&",
    column 54, (pat_comp / pat_cnt * 100.0) using "##&.&&%"

```

```

print
    column 10, "EOC",
    column 30, eoc_cnt using "#,###,##&",
    column 40, grp_tot_eoc_comp using "#,###,##&",
    column 54, (grp_tot_eoc_comp / eoc_cnt * 100.0) using "##&.&&%"

```

```

skip 2 lines

```

```

print
    column 10, "EOC Window: ", win_max using "<<&"

```

```

end report

```

```

function init_qual_sql()
    let quote = "\""

```

```

    let q_text =
        "select * from qual_master where index = ", quote, ir.index, quote,
        " and (scope = ", quote, "B", quote, " or scope = ?) ",
        " order by profile desc"

```

```

    prepare mast_state from q_text

```

```

    declare mast_curs cursor for mast_state

```

```

    prepare grp_state from

```

```

        "select * from qual_group where rule_group = ? order by rule_type, rule_id"
    declare grp_curs cursor for grp_state

```

```

    #

```

```

    # Rule type II requires 2 or more occurrences of the index range in the
    # pat. history, but they must occur on different DOS. So group by DOS and
    # if more than one row is returned, then everything is dandy.
    # If cat_cpt is null use ranges for indicator. Otherwise use
    # specific icd9 code in the column qual_ic.cat_cpt
    #

```

```

    # changed 6/15/94 by rrf: no longer prepared here, but within the qual_chk
    # function itself. The cursor is built based on qual_ic information.
    #

```

```

    prepare ic_state from

```

```

        "select * from qual_ic where rule_type = ? and rule_id = ?"
declare ic_curs cursor for ic_state

prepare cnt_cat_state from
        "select count(*) from temp_qual where category = ?"
declare cnt_cat cursor for cnt_cat_state

prepare cc_state from
        "select * from qual_cc where rule_type = ? and rule_id = ?"
declare cc_curs cursor for cc_state

let init_flag = true
end function

function qual_check(in_scope)
define
    in_scope      char(1),          #(P)atient or (E)OC
    qm             record like qual_master.*,
    qg             record like qual_group.*,
    qi             record like qual_ic.*,
    qc             record like qual_cc.*,
    cur_dos        date,
    profile_num     like qual_master.profile,
    first_row,     # boolean used by II rule
    ok_flag,
    cnt,
    passed,        # Data passed Qual checks
    rule_passed     smallint,
    hold_status     integer

let passed = true
let profile_num = null

if init_flag is null or not init_flag then
    call init_qual_sql()
end if

initialize qm.* to null
open mast_curs using in_scope
fetch mast_curs into qm.*
let hold_status = status
while hold_status != notfound
    open grp_curs using qm.rule_group
    fetch grp_curs into qg.*
    while status != notfound
        case
            when qg.rule_type = "II"
                #
                # build select statement based on detail rules then
                # derive count of rows over different DOS
                #
                let q_text =
                    "select date_of_serv, count(*) from temp_qual, tmp_index ",
                    "where icd1 = icd9 "

                let first_row = true

                open ic_curs using qg.rule_type, qg.rule_id
                fetch ic_curs into qi.*
                while status != notfound

```

```

if fld_is_null(qi.cat_cpt) then
  if first_row then
    let first_row = false
    let q_text = q_text clipped,
      " and (tmp_index.indicator = ",
      quote, qi.indicator, quote
  else
    let q_text = q_text clipped,
      " or tmp_index.indicator = ",
      quote, qi.indicator, quote
  end if
else
  if first_row then
    let first_row = false
    let q_text = q_text clipped,
      " and (icd1 = ", quote, qi.cat_cpt, quote
  else
    let q_text = q_text clipped,
      " or icd1 = ", quote, qi.cat_cpt, quote
  end if
end if

fetch ic_curs into qi.*
end while

let q_text = q_text clipped, ") group by 1"
let cnt = 0

prepare cnt_ind_state from q_text
declare cnt_ind cursor for cnt_ind_state

open cnt_ind
fetch cnt_ind into cur_dos, ok_flag
while status != notfound
  let cnt = cnt + 1
  fetch cnt_ind into cur_dos, ok_flag
end while
close cnt_ind

if cnt >= qg.num_required then
  let rule_passed = true
else
  let rule_passed = false
end if
#
# If the qg.logical is false, then invert the results of
# this rule check, ie, False = true, true = false
#
if qg.logical = "F" then
  if rule_passed then
    let rule_passed = false
  else
    let rule_passed = true
  end if
end if
#
# if rule_passed is false then none of the detail parts
# of the rule passed ('OR' boolean) so the patient fails.
# stop checking.
#

```

```

    if not rule_passed then
        let passed = false
        exit while
    end if
when qg.rule_type = "IC"
    let rule_passed = false
    let cnt = 0
    open ic_curs using qg.rule_type, qg.rule_id
    fetch ic_curs into qi.*
    while status != notfound
        open cnt_cat using qi.cat_cpt
        fetch cnt_cat into ok_flag
        close cnt_cat

        let cnt = cnt + ok_flag

        if cnt >= qg.num_required then
            let rule_passed = true
            exit while
        end if

        fetch ic_curs into qi.*
    end while
    #
    # If the qg.logical is false, then invert the results of
    # this rule check, ie, False = true, true = false
    #
    if qg.logical = "F" then
        if rule_passed then
            let rule_passed = false
        else
            let rule_passed = true
        end if
    end if
    #
    # if rule_passed is false then none of the detail parts
    # of the rule passed ('OR' boolean) so the patient fails.
    # stop checking.
    #
    if not rule_passed then
        let passed = false
        exit while
    end if
when qg.rule_type = "CC"
    open cc_curs using qg.rule_type, qg.rule_id
    fetch cc_curs into qc.*
    while status != notfound
        open cnt_cat using qc.cat_cpt1
        fetch cnt_cat into cnt
        close cnt_cat

        if cnt >= 1 then
            open cnt_cat using qc.cat_cpt2
            fetch cnt_cat into cnt
            close cnt_cat

            if cnt < qg.num_required then
                if qg.logical = "T" then
                    let passed = false
                end if
            end if
        end if
    end while
end if

```

```

else
    if qg.logical = "F" then
        let passed = false
    end if
end if
end if

```

```

if not passed then
    exit while
end if

```

```

    fetch cc_curs into qc.*
end while

```

```

if not passed then
    exit while
end if

```

```

end case

```

```

    fetch grp_curs into qg.*
end while

```

```

# for EOC checks a pass means that a profile has been assigned so exit
# for patients, a failure (not pass) means the client has failed a
# qualifying condition so don't bother checking any others (exit).
#

```

```

if passed then
    if in_scope = "E" then
        exit while
    end if

```

```

else
    if in_scope = "P" then
        exit while
    end if
end if

```

```

fetch mast_curs into qm.*

```

```

let hold_status = status

```

```

if not passed then
    if hold_status != notfound then
        let passed = true
    end if

```

```

else
    exit while
end if

```

```

end while

```

```

let profile_num = qm.profile

```

```

return passed, profile_num, qi.rule_id

```

```

end function

```



## Source Code (PPRAM)

```

*****
1  MAIN.4GL
2
3  Programmer: Matt Bentley
4              Rod Fredette
5              Steve Wenzbauer
6
7  Purpose: This is the main module for the pp_ram.4ge executable program.
8
9  Revised: March 7, 1994
10           March 16, 1994 rrf added check of gendbs:app_stat table
11           March 22, 1994 sjw changed which fields are checked for
12              determination of a single bill.
13 *****
14 )globals "ces_globals.4gl"

```

```

define
  a_s      record like gendbs:app_stat.*,
  log_msg  char(150),
  cpt_cnt  integer                # count of bad cpt's

```

```
main
```

```

define
  fileptr, offset, s_analyzed, s_bad int,
  filename char(50),
  fnd      smallint,
  quote    char(1)

```

```
set lock mode to wait
```

```

if num_args() < 1 then
  display "Usage: pp_ram.4ge <filename>"
  exit program
else
  let filename = arg_val(1)
  let fileptr = lopentext(filename, "r")
  (let fileptr = lopentext("/dev/rmt/tf0", "r"))
  if fileptr < 0 then

```

```

    display "ERROR: Bad filename"
    exit program
  end if
end if

```

```

let log_msg = "/client1/pracparam/", filename clipped, ".log"
call startlog(log_msg)
call errorlog("Starting: ")

```

```

# # Check app_stat table to determine if a row exists for this filename
# # If not, then add one, else update stat = "Y". At each interval as
# # stated in the app_stat table, check the app_stat table, if STAT="N"
# # then exit program gracefully.

```

```

select * into a_s.*
from gendbs:app_stat
where app = filename
if status = notfound then
  let a_s.app = filename
  let a_s.stat = "Y"

```

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```

let a_s.interval = 1000
insert into gendbs:app_stat values (a_s.*)
else
  let a_s.stat = "Y"
  update gendbs:app_stat set stat = a_s.stat
  where app = a_s.app
end if

let quote = "\""
let log_msg = "select * from gendbs:app_stat where app = ",
quote, filename clipped, quote
prepare chk_stat_state from log_msg
declare chk_stat_cursor for chk_stat_state

(* Determine what record to start at, if no record exists then start at 1 *)
let log_msg="select rooo,analyzed,badcpt from EDS:LOADSTAT ",
" where file = '", filename clipped,'"
prepare get_rooo from log_msg
declare c_get_rooo cursor for get_rooo
open c_get_rooo
fetch c_get_rooo into offset,s_analyzed,s_bad
if status = notfound then
  let offset = 0
  let s_analyzed = 0
  let s_bad = 0
else
  let offset = offset + 1      #1000
end if
close c_get_rooo
free c_get_rooo

let log_msg =
  "update eds:loadstat set (rooo,analyzed, badcpt)=(?,?,?) where file ='",
  filename clipped,'"
prepare einsstat from log_msg

(*****
* This code added by SJW on 3/7/94.
* Purpose: If the file doesn't already have an entry in the loadstat table
* the program needs to insert a initialized row for it, which it
* wasn't previously doing. If a row does exist, it will set the
* numbers back to 0.
*****
let log_msg =
  "select count(*) from EDS:LOADSTAT where FILE=''", filename clipped, ""
prepare chk_loadstat from log_msg
declare c_chk_loadstat cursor for chk_loadstat
open c_chk_loadstat
fetch c_chk_loadstat into fnd
close c_chk_loadstat
free c_chk_loadstat
free c_chk_loadstat

if ( fnd) then
  execute einsstat using "0","0", "0"
else
  let log_msg = "insert into EDS:LOADSTAT values (?,?,?,?)"
  prepare new_loadstat from log_msg
  execute new_loadstat using filename, "0", "0", "0"
  free new_loadstat

```

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```

end if
#delete from tb_imp_log where num = 99999

(* If an offset was specified then skip to that row now *)
if offset > 0 then
    call skip_to_row( fileptr, offset)
end if
call proc_file(fileptr, offset, s_analyzed, s_bad)

call lclosetext(fileptr)

if a_s_stat = "N" then
    call errorlog ("Exiting due to change app_stat flag setting!")
else
    call errorlog("DONE")
end if
end main

function proc_file(infile, l_offset, l_analyzed, l_bad)

define
infile, l_offset, l_analyzed, l_bad  int,
keep,                                smallint,
numbytes                             int,
num2,                                smallint,
dumb_cnt,                             int,
cptr                                  int,
tmpdate                               char(6),
proctype                              char(1),
prev_rend                             char(12),
prev_pat                              char(9),
prev_date                             date,
prev_relat                             char(2),
prev_sex                              char(1),
is_over,                              smallint,
prev_age                             smallint

# Create a cursor for the LOS X-walk
#
prepare ex_los from "select new_proc from RAM_XW where LOS_PROC=?"
declare c_los cursor for ex_los

let log_msg = "select id from eds:member_id where id = ?"
prepare pnm from log_msg
declare getmem cursor for pnm
#
# Create temp CPT table of all valid codes for quicker access
#
select count(*) into cpt_cnt
from systables
where tabname = "temp_cpt"

if not cpt_cnt then
    create table temp_cpt (proc char(5))
    in tmp_eds extent size 300 next size 100;

```

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```
insert into temp_cpt
select unique proc from gendbs.tb_proc
where ((id = 'MED' and rel_date = '11/23/92') or
      (id = 'BED') or
      (id = 'ANE' and rel_date = '08/01/92') or
      (id = 'BNE') or
      (id = 'HCP' and rel_date = '08/01/92') or
      (id = 'BCP') or
      (id = 'DEN' and rel_date = '10/02/92') or
      (id = 'BEN'))

create unique index i_tcidx1 on temp_cpt(proc)
end if

prepare pproc from
"select proc from temp_cpt where proc = ?"
declare getproc cursor for pproc

let log_msg = "select e_prov_id from eds:e_prov where carrier = ?",
              " and rend_prov = ? and bill_prov = ? and zip = ? and spec = ?"
prepare pep from log_msg
declare fep cursor for pep

let log_msg = "select e_claim_id from eds:e_claim where patient = ?",
              " and age = ? and sex = ? and subscriber = ?",
              " and relationship = ? and bill_id = ? and e_prov_id = ?"
prepare pec from log_msg
declare fec cursor for pec

prepare iep from "insert into eds:e_prov values (?, ?, ?, ?, ?, 0)"
prepare iec from "insert into eds:e_claim values (0, ?, ?, ?, ?, ?, ?)"
prepare pel from "insert into eds:e_line values(?, ?, ?, ?, ?, ?, ?, ?, ?)"
declare iel cursor for pel
open iel
let mClimNum = 99999
let rep_carrier = 99999
call Load_UsIs()

for cnt = 1 to 100
  let ga_keep[cnt] = TRUE
end for

call lgtext(infile,0) returning inline, numbytes
let keep = load_cross()

let num2 = numbytes + 1
let cnt = 1 + l_offset
let dumb_cnt = 0 + l_analyzed
let cpt_cnt = 0 + l_bad
let Onedaycnt = 0
let prev_rend = rep.rend_prov
let prev_pat = rec.patient
let prev_date = rel.date_of_serv
let prev_relat = rec.relationship
let prev_age = rec.age,
let prev_sex = rec.sex
let is_over = false

while numbytes > 0
```

```

let keep = load_cross()

if rec.patient <> prev_pat or
  rep.rend_prov <> prev_rend or
  rel.date_of_serv <> prev_date or
  rec.age <> prev_age or
  rec.sex <> prev_sex or
  rec.relationship <> prev_relat then

  let dumb_cnt = dumb_cnt + Onedaycnt
  call do_that_analyze_thing()
  call eds_insert(Onedaycnt)
  let is_over = false
  let Onedaycnt = 0

  if a.s.stat = "N" then
    exit while
  end if

  let prev_date = rel.date_of_serv
  let prev_rend = rep.rend_prov
  let prev_pat = rec.patient
  let prev_relat = rec.relationship
  let prev_age = rec.age
  let prev_sex = rec.sex
end if

if keep then
  let Onedaycnt = Onedaycnt + 1
  if Onedaycnt > 99 then
    let Onedaycnt = 99
    if not is_over then
      let is_over = true
      let log_msg = "Claim over 100 at Row: ", cntr using "<<<, <<<, <<<&"
      call errorlog(log_msg)
    end if
  else
    call loadarray(Onedaycnt)
  end if
end if

call lgtextx(infile,num2) returning inline, numbytes
let cntr = cntr + 1

if cntr mod a.s.interval = 0 then
  flush iel
  execute einstat using cntr, dumb_cnt, cpt_cnt
  let log_msg = "Row count: ", cntr using "<<<, <<<, <<<&"
  " Oneday: ", dumb_cnt using "<<<, <<<, <<<&"
  " BadCPT: ", cpt_cnt using "<<<, <<<, <<<&"
  call errorlog(log_msg)
#
# Check app.stat table to see if someone wants us to finish up and
# also see if a new interval has been requested
#
open chk_stat
fetch chk_stat into a.s.*
close chk_stat
end if
end while

```

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```

let Oneday[counter].prov_zip = ga_eds[counter].zip
let Oneday[counter].pos = ga_eds[counter].pos
let Oneday[counter].tos = ga_eds[counter].tos
let Oneday[counter].cpt = ga_eds[counter].cpt
let Oneday[counter].misc_cost = ga_eds[counter].charge
let Oneday[counter].cost = ga_eds[counter].allow_amt
let Oneday[counter].icd1 = ga_eds[counter].icd1
let Oneday[counter].icd2 = ga_eds[counter].icd2
let Oneday[counter].icd3 = ga_eds[counter].icd3
let Oneday[counter].icd4 = ga_eds[counter].icd4
let Oneday[counter].age = ga_eds[counter].age
let Oneday[counter].sex = ga_eds[counter].sex
let Oneday[counter].specialty = ga_eds[counter].spec
let Oneday[counter].modifier = ga_eds[counter].mod_1

```

end function

function load\_cross()

```

define
    tmp_cpt      char(5),
    provtype     char(1),
    ret_val      smallint,
    tmpdate      char(6)

```

```

let ret_val = 0
let rec_bill_id = inline[41,55]
let provtype = inline[88]
if provtype = "2" or provtype = "u" then
    ## e_prov columns
    let rep_carrier = 99999
    let rep_rend_prov = inline[22,33]
    let rep_bill_prov = inline[22,33]
    let rep_zip = inline[34,38]
    let rep_spec = inline[39,40]
    ## e_claim columns
    let rec_patient = inline[1,9]
    let rec_age = inline[13,15]
    let rec_sex = inline[12]
    let rec_subscriber = " "
    let rec_relationship = inline[10,11]
    ## e_line columns
    let tmpdate = fixdate(inline[16,21])
    let rel_date_of_serv = tmpdate
    let rel_pos = inline[56,57]
    let rel_tos = inline[58,60]
    let rel_cpt = inline[61,65]
    let rel_mod_1 = " "
    let rel_mod_2 = " "
    let rel_charge = inline[66,72]
    let rel_allow_amt = inline[66,72]
    let rel_anc_time = 0
    let rel_icd1 = inline[75,79]
    let rel_icd2 = " "
    let rel_icd3 = " "
    let rel_icd4 = " "

```

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```

open getmem using rec.patient
fetch getmem into rec.patient
if status <> 0 then
  {*****}
  * This code added 5/16/94 by SJW
  * This is to cross walk old LOS codes to current E&M codes so that
  * CES will analyze them properly.
  {*****}
  open c_los using rel.cpt
  fetch c_los into tmp_cpt
  if not(status) then
    let rel.cpt = tmp_cpt
  end if
  close c_los

  open getproc using rel.cpt
  fetch getproc into rel.cpt
  if status = 0 then
    let ret_val = 1
    call cross_wok()
  else
    let cpt_cnt = cpt_cnt + 1
  end if
  close getproc
end if

return ret_val
end function

function fixdate(lcdate)
define lcdate char(6)

define
  retdate char(6),
  lmonth char(2),
  lday char(2),
  lyear char(2)

let lday = lcdate[5,6]
let lmonth = lcdate[3,4]
let lyear = lcdate[1,2]

if lyear > "99" or lyear < "00" then
  let lyear = "01"
end if

case
when lmonth = "01" or lmonth = "03" or lmonth = "05" or lmonth = "07" or
lmonth = "08" or lmonth = "10" or lmonth = "12"

if lday > "31" or lday < "01" then
  let lday = "31"
end if
when lmonth = "04" or lmonth = "06" or lmonth = "09" or lmonth = "11"
if lday > "30" or lday < "01" then
  let lday = "30"
end if

```

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```
when lmonth = "02"  
  if lday > "28" or lday < "01" then  
    let lday = "28"  
  end if  
  otherwise  
    let lday = "01"  
    let lmonth = "01"  
  end case  
  
  let retdate = lmonth, lday, lyear  
  
  return retdate  
end function
```

```
function eds insert(lrecrd_cnt)  
  define lrecrd_cnt smallint
```

```
  define  
    counter smallint,  
    new_prov_id,  
    new_claim_id integer
```

```
  let new_prov_id = null  
  let new_claim_id = null
```

```
  for counter = 1 to lrecrd_cnt  
    if ga_keep[counter] then
```

```
      open fep using ga_eds[counter].carrier,  
        ga_eds[counter].rend_prov,  
        ga_eds[counter].bill_prov,  
        ga_eds[counter].zip,  
        ga_eds[counter].spec
```

```
      fetch fep into new_prov_id  
      if status = notfound then
```

```
        execute iep using ga_eds[counter].carrier,  
          ga_eds[counter].rend_prov,  
          ga_eds[counter].bill_prov,  
          ga_eds[counter].zip,  
          ga_eds[counter].spec  
        let new_prov_id = sqlca.sqlerrd[2]
```

```
        execute iec using ga_eds[counter].patient,  
          ga_eds[counter].age,  
          ga_eds[counter].sex,  
          ga_eds[counter].subscriber,  
          ga_eds[counter].relationship,  
          ga_eds[counter].bill_id,  
          new_prov_id
```

```
      let new_claim_id = sqlca.sqlerrd[2]
```

```
    else  
      open fec using ga_eds[counter].patient,  
        ga_eds[counter].age,  
        ga_eds[counter].sex,  
        ga_eds[counter].subscriber,  
        ga_eds[counter].relationship,  
        ga_eds[counter].bill_id,
```

```

new_prov_id
fetch fec into new_claim_id
if status = notfound then
  execute iec using ga_eds[counter].patient,
    ga_eds[counter].age,
    ga_eds[counter].sex,
    ga_eds[counter].subscriber,
    ga_eds[counter].relationship,
    ga_eds[counter].bill_id,
    new_prov_id
  let new_claim_id = sqlca.sqlerrd[2]
end if
end if
#
# Just get the prov_id / claim_id for the first keeper, then exit
#
exit for
end if
end for

```

```

if new_prov_id is not null then
  for counter = 1 to lrecrd_cnt
    let ga_eds[counter].e_prov_id = new_prov_id
    let ga_eds[counter].e_claim_id = new_claim_id
  if ga_keep[counter] then
    put iel from ga_eds[counter].e_claim_id,
      ga_eds[counter].date_of_serv,
      ga_eds[counter].pos,
      ga_eds[counter].tos,
      ga_eds[counter].cpt,
      ga_eds[counter].mod_1,
      ga_eds[counter].mod_2,
      ga_eds[counter].charge,
      ga_eds[counter].allow_amt,
      ga_eds[counter].anes_time,
      ga_eds[counter].icd1,
      ga_eds[counter].icd2,
      ga_eds[counter].icd3,
      ga_eds[counter].icd4
  end if
end for

```

```

for counter = 1 to lrecrd_cnt
  if ga_keep[counter] = TRUE then
    end if
  end for
end function

```

```

unction sort_this_bill_into_dates_of_service(larray_cnt)
  define larray_cnt smallint,
    define i, j smallint

```

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```

for i = 1 to (larray_cnt - 1)
    for j = (i + 1) to larray_cnt
        if ga_eds[j].date_of_serv < ga_eds[i].date_of_serv then
            let ga_eds[100].* = ga_eds[i].*
            let ga_eds[i].* = ga_eds[j].*
            let ga_eds[j].* = ga_eds[100].*
        end if
    end for
end for
end function

```

```

function cross_wok()

```

```

    if rel.icd1[4] = "." then
        let rel.icd1 = rel.icd1[1,3],rel.icd1[5]
    end if
    if rel.icd2[4] = "." then
        let rel.icd2 = rel.icd2[1,3],rel.icd2[5]
    end if
    if rel.icd3[4] = "." then
        let rel.icd3 = rel.icd3[1,3],rel.icd3[5]
    end if
    if rel.icd4[4] = "." then
        let rel.icd4 = rel.icd4[1,3],rel.icd4[5]
    end if

```

```

case
    when rec.sex = "1"
        let rec.sex = "M"
    when rec.sex = "2"
        let rec.sex = "F"
    when upshift(rec.sex) = "F"
        let rec.sex = "F"
    when upshift(rec.sex) = "M"
        let rec.sex = "M"
    otherwise
        let rec.sex = "Q"
    end case

```

```

    if rel.tos[1] = "4" then
        let rep.spec = "5"
    end if

```

```

case
    when rel.tos[1] = "4"
        let rep.spec = "5"
    when rel.tos = "210"
        let rel.mod_1 = "80"
    end case

```

```

case
    when rel.pos = "00" or rel.pos = "0G" or rel.pos = "53" or rel.pos = "54"
        or rel.pos = "55" or rel.pos = "90" or rel.pos = "9A"
        or rel.pos = "9C" or rel.pos = "9D" or rel.pos = "8D"
        let rel.pos = "7"

```

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```

when rel.pos = "88m" or rel.pos = "88r" or rel.pos = "C0" or rel.pos = "10a"
  or rel.pos = "00"
  let rel.pos = "7"
  when rel.pos = "10" or rel.pos = "15" or rel.pos = "17" or rel.pos = "51"
    let rel.pos = "3"
  when rel.pos = "20" or rel.pos = "2f" or rel.pos = "2S" or rel.pos = "22"
    or rel.pos = "52" or rel.pos = "56" or rel.pos = "8f" or rel.pos = "80"
  let rel.pos = "8"
  when rel.pos = "30"
    let rel.pos = "1"
  when rel.pos = "3S" or rel.pos = "40" or rel.pos = "4S"
    let rel.pos = "2"
  when rel.pos = "6"
    let rel.pos = "70" or rel.pos = "80" or rel.pos = "8S"
    let rel.pos = "4"
  end case
end case

```

```
case rec.relationship
when "A" then
  let rec.relationship = "1"
when "C" then
  let rec.relationship = "2"
when "E" then
  let rec.relationship = "3"
when "H" then
  let rec.relationship = "4"
when "D" then
  let rec.relationship = "5"
when "F" then
  let rec.relationship = "6"
when "L" then
  let rec.relationship = "7"
when "R" then
  let rec.relationship = "8"
when "S" then
  let rec.relationship = "9"
when "P" then
  let rec.relationship = "0"
when "5" then
  let rec.relationship = "A"
when "3" then
  let rec.relationship = "B"
when "1" then
  let rec.relationship = "C"
end case
```

nd function

```
function skip_to_row( l_file, l_offset)
define
    l_file, l_offset integer
define
    numbytes, totbytes integer
```

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```

call lgettext( l_file,0) returning inline, numbytes
let totbytes = numbytes + 1
let l_offset = l_offset - 1

while (numbytes > 0) and (l_offset > 0)
  call lgettext( l_file,totbytes) returning inline, numbytes
  let l_offset = l_offset - 1
end while

```

```

end function
(*****
; analyze.4gl

```

```

Programmer: Matt Bentley
           Rod Fredette
           Steve Menzbauer

```

```

Purpose: This module calls the analyze functions & merges the results.
Revised: March 3, 1994
        March 22, 1994 sjw Changed the sort routine and ACW portion
        of the merge function.

```

```

*****
.labels
"ces_globs.4gl"

```

```

* Static Variables *}
.define
bigcnt smallint

```

# CONFIDENTIAL

```

function do_that_analyze_thing()

```

```

(* Analyze the Bill Here *)
let bigcnt = Onedaycnt
call final_bill()
call order_bill()
call cesmain()

```

```

(* Fix the bill based on log file here *)
call do_that_merge_thing( Oneday[1].provider, Oneday[1].zdate,
Oneday[1].carrier, Oneday[1].bill)
let Onedaycnt = bigcnt

```

```

end function

```

```

function do_that_merge_thing( l_provid, l_dos, l_patient, l_pat_info)
define l_provid char(15)
define l_dos date
define l_patient char(15)
define l_pat_info char(15)

```

```

define

```

```

the_log RECORD LIKE tb_imp_log.*,
the_line, asd_fnd smallint

declare q_curs cursor for
select * from TB_IMP_LOG
where (NUM = mclinum) and (BILL = l_pat_info) and (ZDATE = l_dos) and
      (CARRIER = l_patient) and (PROVIDER = l_provid)

```

```

foreach q_curs INTO the_log.*
if bigcnt = 0 then
  exit foreach
end if
let the_line = the_log.line

case the_log.error
when "REB"
  call insert_me( the_log.trigger, the_log.cost)
when "SAS"
  let ga_keep[the_line] = FALSE
when "UUD"
  let ga_keep[the_line] = FALSE
when "UID"
  let ga_keep[the_line] = FALSE
when "UED"
  let ga_keep[the_line] = FALSE
when "UUS"
  let ga_keep[the_line] = FALSE
when "UIS"
  let ga_keep[the_line] = FALSE
when "UES"
  let ga_keep[the_line] = FALSE
when "TRA"
  let ga_keep[the_line] = FALSE
when "MFD"
  call fix_mfd( the_log.trigger)
when "ASD"
  let ga_keep[the_line] = FALSE
when "ACW"
  (* We know that the original line should be thrown out *)
  let ga_keep[the_line] = FALSE

```

```

##
## If we find an ACW flag, we need to see if it's line was subsequently
## deleted with an ASD flag.
## If so, we won't insert the crosswalked code at all because there
## will be no way to track the inserted line when it comes time to
## delete it for the ASD. Got it?
##
select count(*) into asd_fnd from TB_IMP_LOG
where (NUM = mclinum) and (BILL = l_pat_info) and (ZDATE = l_dos) and
      (CARRIER = l_patient) and (PROVIDER = l_provid) and
      (ERROR = "ASD") and (LINE = the_line)
if not( asd_fnd) then
  call insert_me( the_log.driver, the_log.cost)
end if
end case
end foreach
end function

```

# CONFIDENTIAL

```

function insert_me( l_trigger, l_cost)
define l_trigger like TB_IMP_LOG.TRIGGER
define l_cost like TB_IMP_LOG.COST

let bigcnt = bigcnt + 1
if bigcnt <= 100 then
    let ga_keep[bigcnt] = TRUE

    (* Change the Big array here - element bigcnt *)
    let ga_eds[bigcnt].* = ga_eds[1].*

    let ga_eds[bigcnt].allow_amt = abs(l_cost)
    let ga_eds[bigcnt].cpt = l_trigger
else
    let bigcnt = 0
end if

end function

function fix_mfd( l_trigger)
define l_trigger like TB_IMP_LOG.TRIGGER

define
    mfd_rec array[100] of record
        cost char(5),
        cost int,
        idx smallint
    end record,
    cur_cnt, i, code_cnt, max_allowed integer,
    the_line smallint

let code_cnt = 0
select MAXFREQUENCY into char_max from V_PROCEDIT
where (PROC = l_trigger) and (USL = mfd_c)
let max_allowed = char_max

(* Get all the lines with the CPT code into the array *)
for cur_cnt = 1 to bigcnt
    if ga_eds[cur_cnt].cpt = l_trigger then
        let code_cnt = code_cnt + 1
        let mfd_rec[code_cnt].proc = ga_eds[cur_cnt].cpt
        let mfd_rec[code_cnt].cost = ga_eds[cur_cnt].allow_amt
        let mfd_rec[code_cnt].idx = cur_cnt
    end if
end for

(* Sort the Array by descending cost *)
for cur_cnt = 1 to (code_cnt-1)
    for i = (cur_cnt+1) to code_cnt
        if mfd_rec[cur_cnt].cost < mfd_rec[i].cost then
            let mfd_rec[100].* = mfd_rec[cur_cnt].*

```

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```

let mfd_rec[cur_cnt].* = mfd_rec[i].*
let mfd_rec[i].* = mfd_rec[100].*
end if
end for
end for

(* Determine which lines should be deleted *)
for cur_cnt = 1 to code_cnt
  if (cur_cnt > max_allowed) then
    (* Delete this line item *)
    let the_line = mfd_rec[cur_cnt].idx
    let ga_keep[the_line] = FALSE
  end if
end for

nd function

*****
final_bill()
*****
This function will initialize various columns in the current bill.
Fields that will be initialized: RVU, LINE, UNLISTED, MOOCHECK, SEX
*****
nction final_bill()

define
  theDesc char(48),
  theCnt integer,
  cnt smallint

for cnt = 1 to Onedaycnt
  let ga_keep[cnt] = TRUE
  let Oneday[cnt].line = cnt

  if lValidcpt( Oneday[cnt].cpt) and Oneday[cnt].cpt[1,3] != "099" then
    if Oneday[cnt].cpt < "02000" then
      let Oneday[cnt].rvu = -2
    else
      select RVU into Oneday[cnt].rvu from V_PROCDDESC
        where PROC = Oneday[cnt].cpt
    end if
  else
    let Oneday[cnt].rvu = -1
  end if
end if
end for

nd function

nction order_bill()

define cur_cnt, 1 smallint

```

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```

(* Order by RVU desc *)
for cur_cnt = 1 to (Onedaycnt-1)
  for i = (cur_cnt+1) to Onedaycnt
    if (Oneday[cur_cnt].rvu < Oneday[i].rvu) or
       (Oneday[cur_cnt].rvu = Oneday[i].rvu) and
       ((Oneday[cur_cnt].cpt > Oneday[i].cpt) or
        (Oneday[cur_cnt].rvu = Oneday[i].rvu) and
        (Oneday[cur_cnt].cpt = Oneday[i].cpt) and
        (Oneday[cur_cnt].cost < Oneday[i].cost)) then
      let Oneday[100].* = Oneday[cur_cnt].*
      let Oneday[cur_cnt].* = Oneday[i].*
      let Oneday[i].* = Oneday[100].*
    end if
  end for
end for

```

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